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CULPEPER'S EVERY MAN HIS OWN DOCTOR;

CONTAINING

THE MEDICAL PART.

TO WHICH IS ADDED

DIRECTIONS FOR MAKING SYRUPS,

AND

THE APPENDIX

TO

CULPEPER'S BRITISH HERBAL.

LONDON:
MILNER AND SOWERBY.
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1867.

CULPEPER'S

EVERY MAN

HIS OWN DOCTOR.

—OU—

A PHYSICAL AND ASTRONOMICAL DESCRIPTION OF MAN.

GOD, the omnipotent and wise Creator, having made all things out of nothing, and from a crude and undigested mass, according to his will, and by his word, brought all things into a decent frame and majestic structure; out of a confused chaos made the heavens and the earth; out of that which was dark and void he created light, he separated the waters from the earth, and gave bounds to the unruly waves; and endued the dry and barren earth with prolific virtue, richly adorned it with grass, herbs, and fruit trees; he made the sun, moon, and stars, to divide the light from the darkness, to enlighten and rule both day and night, to be for signs, and to distinguish seasons, days, and years: by his word he created every living thing that moveth.

Having thus far proceeded in his so excellent and admirable workmanship of creation, he made MAN a summary of the world's fabric, a small draught of the divine nature; he was made after all other creatures, not only as the most perfect, but as the super-

intendent and master, of all things: created *Quod dominetur in piscis maris, et in volucres cæli, et in pecudes, et universam terram, atque in omnia reptila reptantia super terram:* "To rule over the fish in the sea, and over the fowls of the air, and over cattle, and over the earth, and over every creeping thing." *Gen.* i. 28.

In man he ended his work; on man he stamped his seal and sign of his power, on him he has imprinted his own image and superscription, his arms and his portraiture. *Dixit Deus, faciamus hominum ad imaginem nostrum, secundem similitu dinem nostram:* "God said, let us make man in our image, after our likeness." *Gen.* i. 26. In the creation of man, God seemed to deliberate and take counsel with himself, how to epitomize and gather together all his works in so small a compass, to contract his book of creation into so small a volume. Hence he is called the *microcosm*, or little world, the recapitulation of all things, the ligament of angels and beasts, heavenly and earthly, spiritual and corporeal, the perfection of the whole world, the honour and miracle of nature, he created him naked, being a pure neat, and delicate creature, made up of thin, subtile, well tempered and seasoned humours, innocent, and far more beautiful than the rest.

He was created upright, but little touching the earth, quite opposite to the vegetable plant, whose root is therein fixed; far different also from the beast, who is a mean between a plant and himself, and goeth downward, his two extremes tending to the bounds of the horizon; this upright gait belonging only to the human species, as the holiest and most divine creature, his head tending to the heavens, on which he looks, and contemplates with grateful adoration the omnipotence of his Creator.

His body being thus formed of pure subtle earth, as a house and habitation for the soul, God breathed into him *the breath of life, and he became a living*

soul. Gen. ii. 7. So in the ordinary generation and formation, which is made of the seed in the womb, nature observeth the self-same order; the body is first formed as well by the elementary force, which is in the seed and the heat of the matrix, as by the celestial influence of the sun; according to the adage, *Sol et homo generant hominem*: "The sun and man do engender man;" which is done according to the opinion of the most eminent naturalists and physicians, in such order, that the first seven days the seed of the man and the ova of the woman mingle, and they curdle like cream, which is the beginning of conception; the second seven days, the seed is changed into a formless bloody substance, and concocted into a thick and undigested mass of flesh, the proper matter of the child; the next seven days, from this mass is produced and fashioned a gross body, with the three most noble parts, viz. the liver, heart, and brain; the fourth seven days, or near thirty, the whole body is perfected, jointed, and organized, and is fit to entertain the soul, which invests itself in the body (according to the best authority) about the seven-and-thirtieth or fortieth day; at the third month, or thereabout, the infant has motion and sense; and at the ninth month is brought forth. These times cannot be so exactly prefixed, but that by the strength or debility of the seed or matrix they may be either hastened or prolonged. But I shall not enter minutely upon this subject now, but give a more particular description of it hereafter.

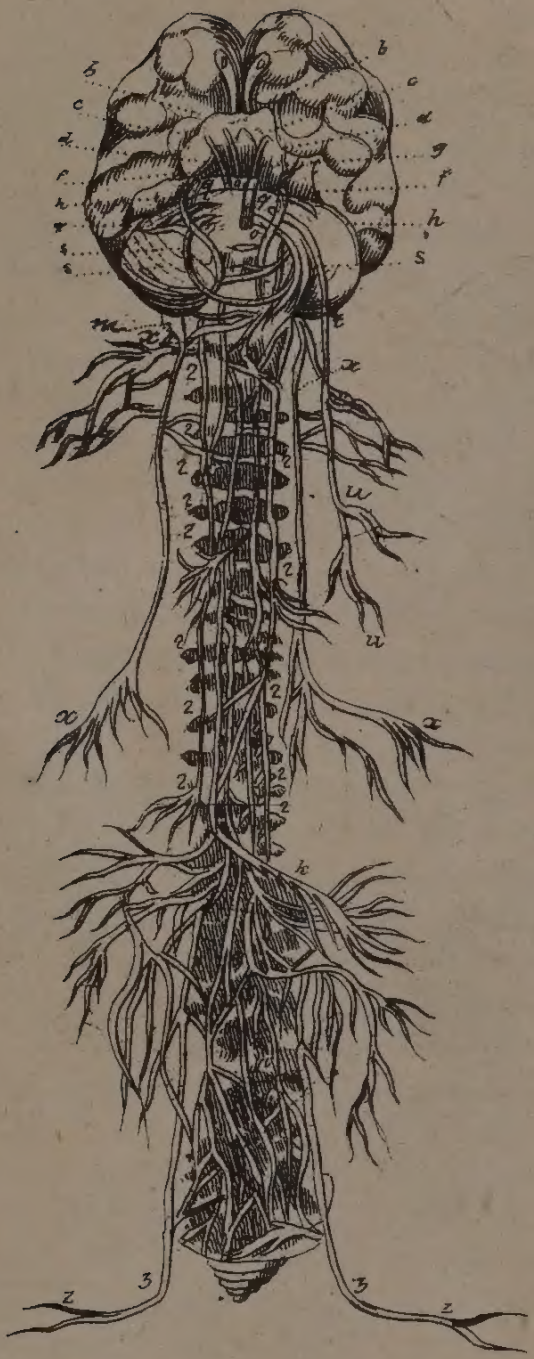
The body of man consists of a number of bones and cartilages, which are the basis and upholding pillars of the whole fabric; the joints are compacted with many ligaments, and are covered with innumerable membranes: the members are supplied with about thirty pair of sensitive nerves, as with little cords; and all filled with as many arteries, like water-pipes, conveying vital spirits to all parts; the

empty places are filled up with above four hundred muscles of different sorts, and covered with a skin.

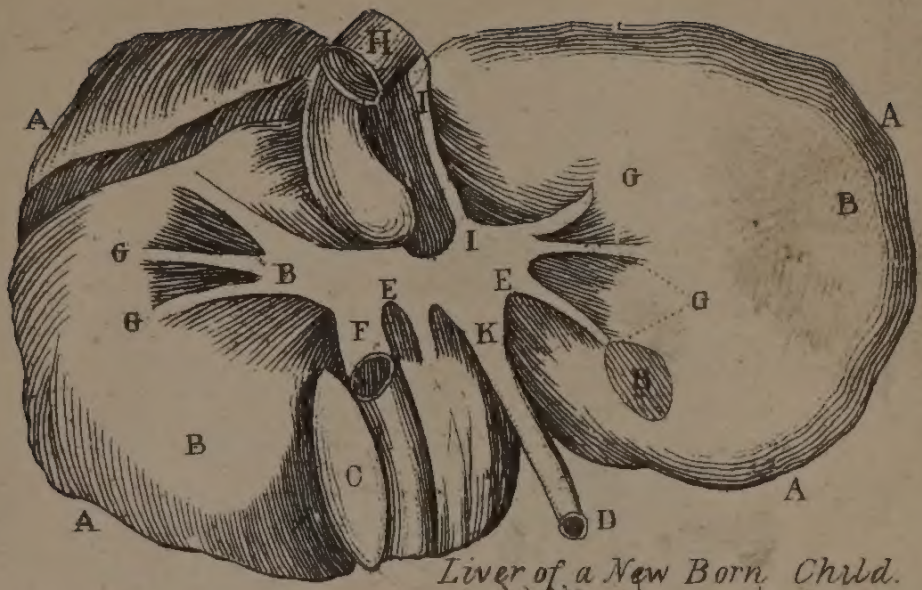
Man, for whom all things were made, is nourished by the balsamic spirits of vegetables, and therefore doth consist of all these faculties, that spring up as a token of health or sickness. The celestial planets have also great influence over him; the moistening power of the Moon is represented by the marrow which flows from the brain; in the genital part is Venus seated; eloquence and comeliness are the effects of nimble-witted Mercury; the Sun hath a near affinity to the heart; benevolent Jupiter hath his seat in the liver, the fountain of nutritive blood; the fiery fury of Mars is lodged in the gall; the spungy and hollow milt, the seat and receptacle of melancholic humours, is a perfect representation of the cold planet Saturn. Indeed, the spirits of the body do manifest and hold forth the quintessence of all things. The four humours in man answer to the four elements; as the bile, which is hot and dry, representeth the fire; hot and moist blood, the air; phlegm, cold and moist, the water; cold and dry melancholy, the earth. Man is an admirable creature, the universe and epitome of the world, and the horizon of corporeal and incorporeal things. I shall conclude this part with the saying of Zoroaster: "O man; the workmanship of most powerful nature, the most artificial master-piece of God's hands!"

A DESCRIPTION OF THE HEAD.

The head of man possesses the highest place in the body, and represents the uppermost and angelical region: it is the fort of man's mind, the seat of reason, the habitation of wisdom, the place of memory, judgment, and cogitation: it containeth the brain, cold and spungious by nature, inclosed with two skins, the one, more hard and thick, joining itself to the *dura mater;* the other, more thin and easy, wherein lieth the brain inclosed, called *pia mater*;



The Nerves of the Human Body.



Liver of a New Born Child.

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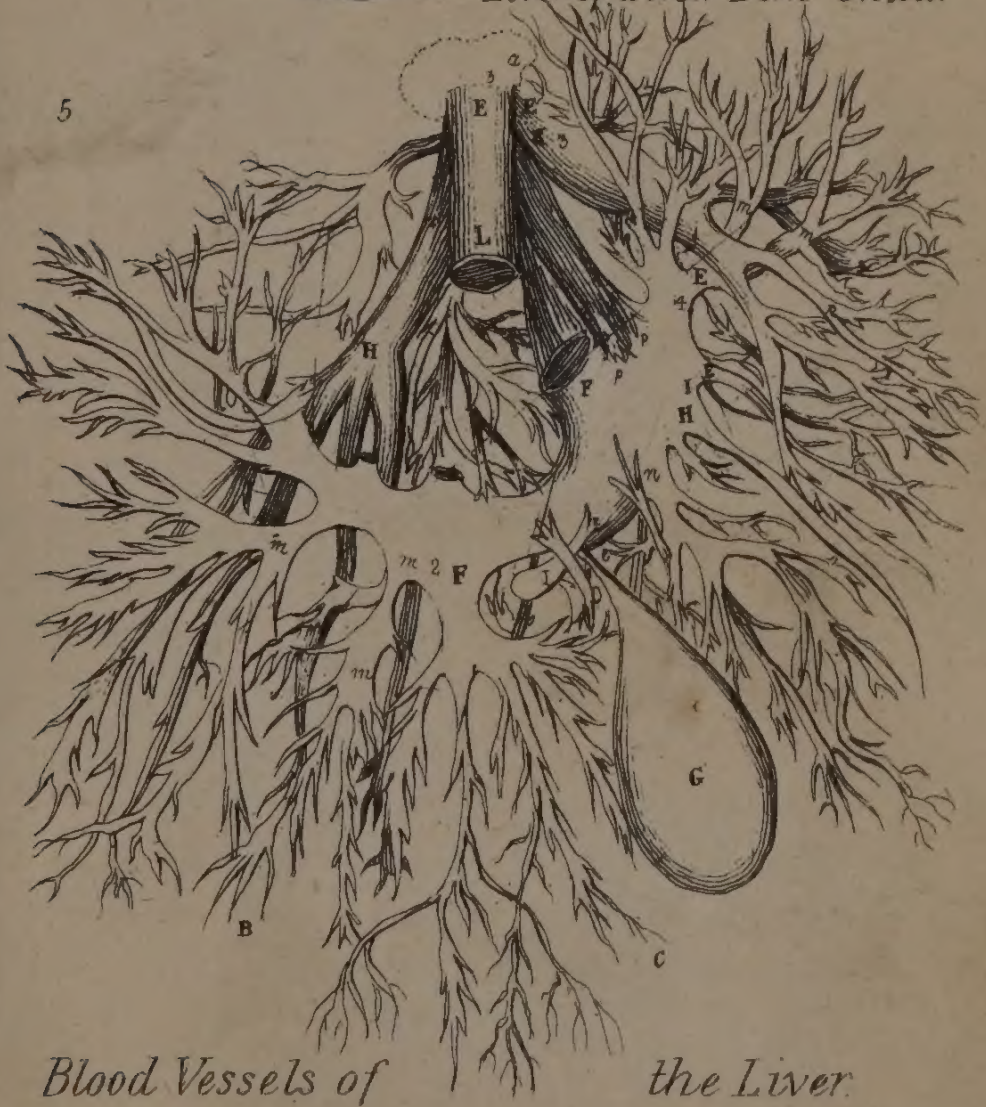

Blood Vessels of the Liver.

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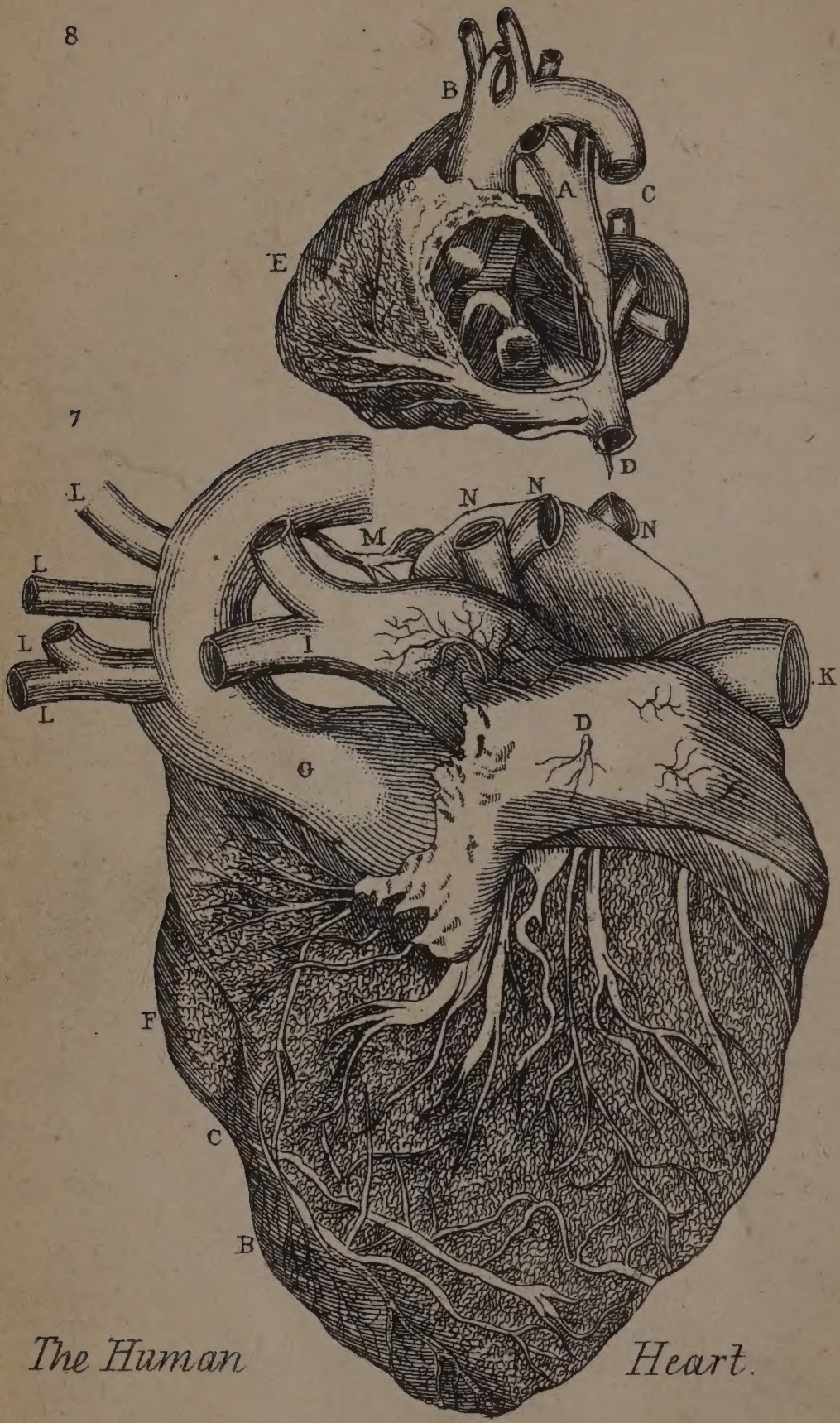

The Human Heart.

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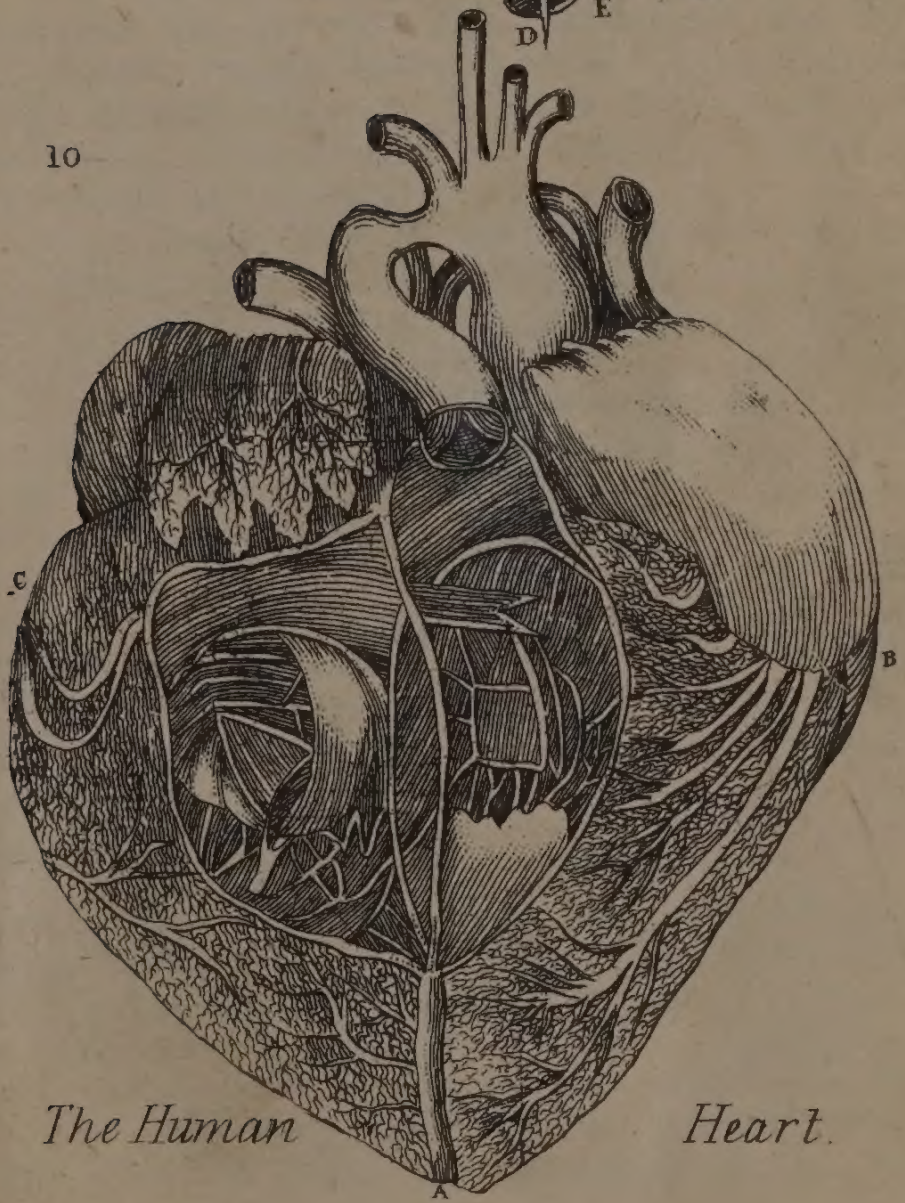


The Human Heart.

it is soft and tender to the brain, and nourisheth it, as a loving mother doth her young and tender babe; from the *pia mater* issue the sinews and marrow that descendeth and falleth down through the *vertibræ* of the back to the reins. In the brain is the seat and throne of the rational soul, in which are a very great number of veins and arteries running through all the substance thereof, administering to the brain both spirit and life, vital and nutrimental nourishment, which comes from the heart and liver by very minute or small veins and arteries; and concocted and reconcocted, elaborated, and made very subtle, passing through those woven and interlaced, turning and winding, in which labyrinth the vital spirit, often passing and repassing, is perfected and refined, and becomes animal.

The *pia mater* divides the substance of the brain into three certain cells and divisions, the foremost part of which contains the most, the middle part less, and the hindmost part the least. In the foremost part of the brain *imagination* is seated; in the middle, *judgment;* in the hindmost part *memory*. Imagination is hot and dry in quality, quick and active, from whence it cometh that frantic men, and such as are sick of hot maladies, are excellent in that which belongs to imagination; many, upon such a distemper, have been excellent in poetry and divination; it never sleepeth, but is always working, whether the man be sleeping or waking; and, by the vapours that arise from the heart, from variety of cogitations, which, wanting the regulation of judgment, *when man sleepeth*, becomes a dream.

Hence it appears that subtlety, promptitude, and that which they commonly call *wit*, belongeth to a hot imagination: it is active, stirring, undertaketh all, and sets all the rest to work; it gathers the kinds of figures of things, both present, by the use of the five senses, and absent, by the common sense.

Judgment is seated in the midst of the brain,

there to bear a rule over the other faculties; it is the seat of the rational soul, and the judge of men's actions: if you would know the means whereby it knoweth and judgeth of things, some authors have been of opinion, that the spirit knoweth by the help of the senses, and that the underctanding without the senses is but as white paper. *Nil est intellectu, quod non feurit prius in sensu*: "There is nothing in the understanding which was not first in the sense." But this opinion is false, because the seeds of science and virtue are insinuated into our spirits, else is the state of the reasonable soul worse than a vegitative or sensitive, which of themselves are able to exercise their functions. It were absurd to think that so noble and divine a faculty should beg assistance of so vile and corruptible a one as the senses, which apprehend only the simple accidents, not the nature or essence, of things: and were it so it must follow, that they who have their senses most perfect should be most witty, whereas we see many times the contrary. Yet let no one think that the spirit hath no service from the senses; for, in the beginning or discovery and invention of things, the senses do much service to the spirit, but the spirit dependeth not upon the senses. Some are of opinion, that it is hot and moist in quality; others say that a dry temperature is proper to the understanding, whereby it came to pass that aged persons excel those in understanding that are young, because as years increase, moisture doth decrease in the brain; hence it followeth, that melancholic persons, that are afflicted with want, and fast much, are wise and ingenious, for heaviness and fasting are great driers: *Splendor ficcus animus sapientissimui, vexatio dat intellectum*; "Heat and draught refine the wit, affliction giveth understanding;" and that is the reason that great persons, who feed high, and take little or no ease, that have nothing to vex them, are for the most part not very wise.

Beasts that are of a dry temperature, as ants, bees, elephants, &c. are cunning and ingenious; on the contrary, they that are of a moist constitution are stupid and without spirit. Memory is seated in the hinder cell of the brain, as the grand accountant or register; some say its temperature is cold and dry, and that is thought to be the reason why melancholic people have good memories; others are of opinion that it is moist, because children have better memories than old men; men are more apt for memory in the morning, by reason of the moisture gained by sleep in the night; but, let it be as it may, it is most certain that those who have a good memory are not in general very wise.

It is true that many have been excellent in this faculty. Seneca repeated two thousand names as they were first spoken; he also, hearing two hundred verses, rehearsed them, and began at the last. Cyrus and Scipio knew every soldier's name in their armies. Mithridates learned the languages of two-and-twenty nations. Esdras the priest had the whole Jewish doctrine by heart. Julius Cæsar would dictate to four at the same time; and that which is more strange, Pliny would dictate to one, hear another, and read at the same instant. As these were so excellent and acute in memory, others were as dull; Atticus could never learn the letters of the alphabet by heart; others could not count above four. It is said that Theodore Beza, two years before he died, as he languished, his mind grew so feeble that he forgot things present, yet held those things which were printed in his mind before-time, when his understanding and memory were good. What shall we say of Messella Cornivus, who forgot his own name? or Franciscus Barbarus, of Athens, a very learned man in the Greek tongue, who having received a blow on the head with a stone, forgot his learning which he had spent the greatest part of his life upon, ret remembered all things else? These

things are brought to pass either by the strength or debility of men's genitures, and from directions and accidents thence proceeding: Wit and understanding, and all the faculties of the soul, depend on a certain temperament; and hence it comes to pass that those who are wise in some things are stupid and dull in others.

OF THE INTERIOR PARTS OF THE HEAD.

THE sensitive faculty has its residence in the *pia mater*; it is that which gives virtue to all the particular senses, and keeps a harmony amongst them: they are five in number, viz. seeing, hearing, smelling, tasting, and feeling; although these are all united in one in the brain, yet operatively they are distinguished in their several seats and places of residence.

The SIGHT resides in the eyes, and particularly in the chrystaline humour; they are two in number, and collateral, planted in the highest stage, as centinels; they are the luminaries of the microcosm; Galen says, the brain and head were made for the eye, that they might be in the highest, as a beholder in a tower; they are next in nature unto the soul; for in the eye are seen and known the disturbances and griefs, gladness and joys of the soul, as love, wrath, and other passions. They are compounded and made of seven tunicles, and coats, and three humours; they proceed out of the substance, they take a pannicle to defend it from annoyance. They meet, and are united into one sinew, about half an inch in length before they enter the skull and after divide into two, each going into one eye; they are called *nervi optici*, the optic nerves, and through these are brought *visible spirits* to the eye.

These are the most noble outward parts of the body, in beauty, utility, nobility, and activity. They are to the visage that which the visage is to the body; they are the face of the face, and be-

cause they are tender, delicate, and precious, they are fenced on all sides with skins, lids, brows and hair. The object of the eye or sight is colour, (according to the common opinion,) which is an adherent quality in bodies, whereof there are six samples, as white, yellow, red, purple, green, and blue; the compounds are infinite; to speak more fully, the true object is light, which is never without colour, and without which the colours are invisible.

The sense of seeing excelleth all the rest in many things; it apprehendeth afar off, and extendeth itself even to the stars. It is certainly reported, that Strabo had such acute eyes, that from Lilybæum he could discern ships going forth out of the Carthaginian haven, and could number them; the distance was one hundred and thirty-five miles. It hath more variety of objects, for to all things, and generally in all, there is a light and colour, the objects of the eyes, as I hinted before. It is most exquisite, in the least and finest thing that presents itself. It is more prompt and sudden, for it apprehendeth even in a moment, and without motion, when the other senses require motion and time. It enjoyeth a liberty incomparable to others; the eye seeth, or seeth not, and therefore hath lids to open or shut; it is active, all the rest purely passive. But that which is most noble in this sense is, that the privation of the object thereof, which is darkness, brings fear, and that naturally, because then a man findeth himself robbed of so excellent a guide; the sight in the light is instead of company, wherein man much delighteth.

HEARING is the next sense to be considered, whose residence is in the ears; it is in quality cold and dry, under the dominion of Saturn. They are placed on the outside of the head, in the self-same height as the eyes are, as the scouts of the body, porters of the spirit, the receivers and judges of the sounds, which always ascend. They have their entrance oblique, and crooked, that so the sound may not enter all at

once, whereby the sense of hearing might be hindered, and not so well able to judge; and again, that the sounds, being fugitive, might there lurk, and abide under his shadow, till the instruments of hearing have gotten possesion thereof. The sinews, that are the organs of hearing, spring each from the brain, and when they come to the hole of the ear, they are wreathed together; the end is like a worm, or little teat, into which is received the sound, and from thence carried to the common wits, to distinguish. The object of the ear, or hearing, is a sound or noise proceeding from the encounter of two bodies; a pleasant and melodious sound sweeteneth and appeaseth the spirit, consequently the body too, and drives maladies from them both; the sharp and penetrant doth trouble and wound the spirit. This sense has many singularities; for the service of the body, the sight is most necessary, but, for the spirit hearing hath the superiority; it is spiritual, the agent of understanding; many that have been blind have been great and wise philosophers, but never any that were deaf. In brief, science, truth, and virtue, have no entrance into the soul but by the ear. Christianity teaches, that faith cometh by hearing, which the sight doth rather hurt than help. Faith is the belief of those things which are not seen, which belief is acquired by hearing. For all these reasons, and many more that might be inserted, the wisest have so much commended hearing, the pure guardian from all corruption, the health of the inward man.

SMELLING is seated in the nose, governed by Mars, and is hot and dry in quality, and therefore martial creatures, or such as are hot and dry of constitution excel in this faculty, as dogs, &c. From the brain come two sinews to the holes of the brain-pan, where beginneth the concavity of the nose, and these two are the proper organs or instruments of smelling; they have heads like paps, into which is received the virtue of smelling, and presenting it to the common

sense. Over these two organs is placed *collatorium*, or the nostrils, which concavity or ditch was made for two causes: First, that the air, that bringeth the spirit of smelling, might rest therein, till it be received by its proper organs. Secondly, that the excrement of the brain might be hidden under it till it be fit to be ejected. From this concavity go two holes into the mouth, of which we may take notice of three conveniences: first, that when a man's mouth is closed, either by eating or sleeping, air might come through them to the lungs, or he would be forced to keep his mouth open always. Secondly, they are helpful to a man's speech; for when one or both of those passages are stopped, a man speaketh in the nose, as we commonly say. Thirdly, they are useful in the cleansing the concavities of the nose, either by snuffing, or drawing it through the mouth. The object of smell is an odour, or scent, which is a fume rising from an odoriferous object, ascending through the nose to the ventricles of the brain; the strong and violent hurteth the brain; the temperate and good do rejoice, delight, and comfort. This sense is oftentimes very useful in discovering meats and drinks of an evil odour, which otherwise would much prejudice the stomach, and work evil effects in the body of the man.

The TASTE is hot and moist, and under the influence of Jupiter; this sense has its residence in the palate of the mouth and tongue. Its office is to choose what food is congruous to the stomach, and what not. The skin of the palate of the mouth is the same with the inward part of the stomach, and the same with the way of the meat to the stomach, and hence it cometh to pass, that when a man is touched upon the palate of the mouth, it tickleth the stomach; and so much the nearer to the throat, so much more the stomach abhorreth. The object of tasting is a savour or smack, whereof there are six simple kinds, as sweet, sour, sharp, tart, salt, and bitter; the compounds are many.

And, being led to the mouth, it is not amiss if I speak a few words of the composition thereof. In the mouth are five parts to be considered, the lips, the teeth, the tongue, the uvula, and the palate of the mouth, of which I have already spoken. The lips are made of a musculous flesh; their office is first, as the door of the house, to keep the mouth closed till the meat be chewed; secondly, they help to pronounce the speech. The teeth, the hardest members, are fastened into the mandible: their office is, first, to grind the meat before it goeth into the stomach, that so it may the better digest; secondly, that it might be a help to the speech, for they that want any of their teeth are defective therein. The number is uncertain, some have more, some have less; they who have their full number have thirty-two. The tongue is a carnous member, compound, and made of many nerves, ligaments, veins, and arteries, ordained principally for three purposes; first that when a man eateth, the tongue may turn the meat in the mouth till it be chewed; secondly, by the tongue, and the palate of the mouth near the roof of the tongue, is received the taste of sweet or sour, and thence presented to common sense to pass judgment thereof; thirdly, and principally, the tongue is ordained for the pronunciation of speech, of which faculty I must crave leave to insist on, and that as briefly as may be. Speech is an excellent present, and very necessary, given only unto man, *animi index and speculum;* it is the interpreter and image of the soul; the heart's messenger; the gate through which doth pass all that lieth within the dark and hidden corners of man: by this the spirit becomes visible. Of all the external and visible parts of the body, that which cometh nearest to the heart is the root thereof, and that which comes nearest to the thought is speech:—"Out of the abundance of the heart the mouth speaketh." It is a powerful master, and imperious commander; it stirreth up, animateth, exasperateth, appeaseth, maketh sad, merry; it imprinteth whatever

passion it handleth; feedeth the soul of the hearer; it maketh him blush, wax pale, laugh, cry, tremble, mad with choler, leap for joy, what not? It is the agent of all our concerns: by it we traffick, peace is handled, affairs are managed; it is the band of human society: hearing and speech answer and are accommodated the one to the other; by these two the souls are poured the one into the other; so that, if these two gates be shut (as it is in those that are deaf and dumb), the spirit remaineth solitary and miserable. Hearing is the gate to enter, by it the spirit receiveth all things from without. Speech is the gate to go out, through it the spirit sendeth forth that which was within. From the communication of these two, as from the stroke of two flints, there cometh forth the fire of truth, and so by the polishing and rubbing of these two, knowledge cometh to perfection; but hearing is the first and principal, for there can nothing come forth which did not first enter; and therefore he that is deaf altogether by nature is also dumb.

I might enlarge a great deal more in the description of the head, but my purpose being to declare nothing but what may be pertinent in the manifestation of human faculties and virtues, I shall conclude this discourse with a word or two of the sense of FEELING, which is of no particular quality, but of all, hot, cold, dry and moist; it is deputed to no particular organ, but is spread abroad over the whole body; it is the index of all tangible things, its object then must be heat or cold, draught or moisture, things pleasant and polite, sharp and smarting, motion, rest, tickling. It is known that man and other creatures may live without some particular sense; it is the opinion of most, that a man cannot live without this sense of feeling, being only necessary unto life; yet Augustine proved the contrary, in the fourteenth book, *De Civitate Dei*, by example of a presbyter, that lay as though he was dead, and did not feel those that pulled him, nor would he stir though they burned him

with fire; yet confessed that he could then hear men speak (if they spoke loud) as though they were far from him, by which it appears, that this he did, not by resisting, but for want of the sense of feeling, which afterwards was restored to him again. I shall pass by what the English history relates of one Elizabeth Barton, a maid of Canterbury, who oftentimes was deprived of her senses by reason of a disease she had.

I shall also wave disputes concerning the number of the senses, some supposing there are no more in nature than are apparent in us. There may very well be more, yet it is greatly to be doubted that there are; it is impossible for us to know them, to affirm them, or to deny them, because a man shall never know the want of that sense which he never had: one sense cannot discover another; and if a man want one by nature, yet he knows not which way to affirm it. A man that is born blind, and hath not heard what sight is, cannot conceive that he seeth not, nor desire to see. So man, being not able to imagine more than the five that he hath, cannot know how to judge whether there be more in nature. Who knoweth whether the difficulties that we find in many of the works of nature, and the effects of many creatures which we cannot understand, do proceed from the want of some sense that we have not? There are hidden properties which we see in many things, and a man may say that there are sensible faculties in nature, proper to judge and apprehend them, yet must conclude we have them not; who knoweth whether it be some particular sense that discovereth the hour of midnight to the cock, and moves him to crow, or how beasts are taught to choose certain herbs for their cure, and many such-like wonders?

OF THE STOMACH.

THE STOMACH is a member compound and spermatic, sinewy and sensible, wherein is made the first perfect digestion of chyle: it is a necessary member to the

body, for, if it fails in its operations, the whole fabric is corrupted. It is in the little world the same as the terrestrial globe is in the great world; in it is expressed the sublunary part of the world; in it are contained the parts that serve for nutrition, concoction, and procreation. And this leads me to discourse of the administering virtues in man, which are here seated, and to wind up all with a touch of the office of the microcosmical stars with as much brevity as may be. The stomach is framed of two panicles, the outer is carnous, the inner nervous, from which is stretched to the mouth the *œsophagus*, or the way of the meat, by which the stomach draweth to itself meat and drink as with hands. By the virtue of the subtle will, which is in this *muscus longitudinalis*, is made the attractive virtue, which is hot and dry, by a quality active, or principal, which appears by the sun, the fountain of all heat, which is of an attractive quality, which is evident by his attracting and exhaling the humidity from this inferior globe into the airy region, as into the neck or higher part of an *alembic;* and, being resolved into water, by reason of their weight (fall down again upon the earth, which is the vessel receiving: so, through continual distillations, by sublimation of the water, by cohabitation, by drawing off the liquor, being often poured on) and fortified by the influence of celestial and central sun, the body becomes endued with a concoctive, nutritive, and procreative virtue. So, in the stomach, by the active quality of the microcosmical sun, his benevolent rays, and friendly heat, meat and drink are desired, and attracted into the stomach, for the nourishment of the whole body.

In the stomach is a transverse muscle, to withhold or make retention; by this retentive virtue, those things that are brought into the stomach are kept and withholden until nature hath wrought her end, and every faculty hath executed its office. It is in quality cold and dry: cold, because the nature of cold

is to compress or hold together, as you may see in ice; dry, because it is the nature of dryness to keep and hold what is compressed. It is under the influence of Saturn, and that is the reason why, for the most part, men that are cold and dry of temperature, or, as astronomers say, Saturnine people, are covetous and tenacious; and that is the reason that old men are naturally covetous, because Saturn ruleth old age, and, by the decay of nature, the temperature becomes cold and dry. It hath the spleen, the representative of Saturn, lying toward the left side, and furnisheth the stomach with humours necessary to fortify the retentive virtue.

The digestive faculty, which is the chief and most principal (the others like handmaids attending it,) is hot and moist, nature's cook and principal workman, the archæus and central fire which in this philosophical vessel, viz. the stomach, digesteth the victuals into a chaos, or confused mass, that so a natural separation may be made. It is under the influence of Jupiter, who furnisheth it with friendly heat and moisture, by the liver, (the microcosmical Jupiter,) chafing and heating the right side of the stomach.

The stomach hath also a latitudinal muscle, or will, which makes the expulsive faculty; it is naturally cold and moist; cold, to compress the superfluity; moist, to make the matter slippery and fit for ejection, also to work a suitable disposition in the body. It is a necessary operation by it, after the separation of the pure from the impure, the elements from the *caput mortuum*, or rather *fæces*, is removed and carried away, and all that is needless or prejudicial to nature. It is under the dominion of the Moon, (with whom you may join Venus, being of the same nature,) whose epitome or microcosmical substitute, viz. the brain, sendeth a branch of nerves to the stomach, and thereby furnisheth it with humours, cold, and moist, fit for expulsion.

OF THE HEART.

THE HEART hath two ventricles or concavities, and the left is higher than the right; the cause of its hollowness is to keep the blood for his nourishing, and the air to abate and temper the great heat which is included and shut up in the concavities.

As he is *sol corporis*, and centre of the rest of the members and ruler of the family, he communicates to them life and motion; yet by his heat he attracts what is needful for himself from the other members, as a subsidy or tax imposed udon his subjects. And therefore to the right ventricle of the heart cometh a vein from the great vein, which receiveth all the substance of the blood from the liver; this vein passeth to the right ventricle of the heart, and bringeth a great portion of the thickest and purest blood to nourish the heart. The residue that is left of this is made more subtle through the virtue and heat of the heart, and then sent into a cavity or pit, in the midst of the heart, between the two ventricles; therein it is made hot and pure, and from thence it passeth to the left ventricle, and there is engendered in a spirit that is clearer, brighter, and subtler, than any corporeal or bodily thing which is engendered of the four elements, for it is a mean between the body and the soul: wherefore, of the philosophers, it is likened more to heavenly than earthly things.

From the left ventricle of the heart spring two arteries, the one having but one coat, and therefore is called *arteria venalis*, which carries blood from the heart to the lungs, which blood is vaporous and fit for its nourishment, and carrieth back air from the lungs to refresh the heart.

The other artery hath two coats: it is called, *vena arterialis*, or the great artery, of which springeth all the other arteries, that spread to every member of the body, which carry the spirits, which are the treasures of the soul's virtue; thus it passeth till it come to the

brain, and be made an animal spirit; at the liver it is made nutrimental, and at the testicles generative. Thus by the heart is made a spirit of every kind, and (like the sun in the heavens) by his royal presence he doth confer life and liberty on his suppliants.

The motion of the heart is wonderful; it continues to the utmost periond of life, day and night, without a single moment's interruption or intermission; and is performed more than an hundred thousand times every day. Here is, indeed, something like what the mechanists want, under the name of a perpetual motion; and the stupendous wisdom of the Creator is in nothing expressed more gloriously.

OF THE LUNGS, LIVER, &c.

THE LUNGS are made of a substance very soft and spongious; supple to draw and enforce from, like a pair of bellows; they are an instrument of respiration, whereby the heart is refreshed, drawing unto it the blood, the spirits, and the air, and disburthening itself of those fumes and excrements which oppress it. They are naturally cold and dry, waving about the heart, abating its refreshing blast: they are accidentally cold and moist, by reason of catarrhs and rheums, which they receive from the brain.

There are three principal parts in the lungs: One as a vein coming from the liver, which bringeth with it the crude and undigested part of the chyle to feed the lungs. Another is *artersa venalis*, coming from the heart, bringing the spirit of life to nourish the lungs. The third is *trachia arteria*, that bringeth air to the lungs, and it passeth through all the left part of them to do its office.

The lungs are divided into five portions or pellicles, three on the right side and two on the left side; that, in case any impediment or hurt should happen in any one part, the other should be ready to supply the office.

I shall give no farther description of the lungs,

but describe the liver, which is a principal member in the little world, representing the planet Jupiter, *quasi jurans pater*, hot and moist, inclining towards the right side, under the short ribs. The form of the the liver is gibbous, or bunchy, on the backside ; on the other side hollow, like the inside of a hand, that it might be pliable to the stomach (as a man's hand is to an apple, or anything that is round) to further its digestion : for its heat is to the stomach as the heat of a fire is to the pot, which hangeth over it. It is the storehouse of the blood, the fountain of the veins, the seat of the natural nourishing faculty, or vegetative soul, engendered of the blood of that chyle which draweth from the meseriac veins, and received by the *vena porta*, which entereth into the cavities thereof, and afterwards is sent and distributed through the whole body by the help of *vena cava*, which arise from the bunch of branches thereof, which are in great numbers as the rivers from the ocean.

The natural and nutrimental faculty hath its residence in the liver, and is dispersed through the whole body with the veins, from which are bred four particular humours, viz. blood, choler, phlegm and melancholy.

Blood is made of meat perfectly concocted, in quality hot and moist, Jupiter's darling, the most perfect and necessary humour (the other three being superfluities, yet necessary too.) The blood thus concocted is drawn out by the *vena cava*, whose branches ramifying upwards and downwards, carry and convey it to all the other members of the body for their nourishment, where, by a third digestion it is transmuted into the flesh.

Choler or bile is made of meat more than perfectly concocted ; it is the spume or froth of blood ; it clarifieth all the humours, heats the body, and nourisheth the apprehension. It is in quality hot and dry, it fortifieth the attractive faculty, as blood doth the digestive ; it moveth man to activity and

valour: it is under the planet Mars, whose residence is in the gall, which is an official member, a purse or panicular vesicle placed in the hollowness of the liver, whose office is to receive the choleric superfluities, which are engendered in the liver as aforesaid. This purse or bag, hath three holes or necks. By the first it draweth to itself the choler from the liver, that so the blood be not hurt by the bile, or choler. By the second it sendeth choler to the bottom of the stomach, to fortify the attractive faculty. And, lastly, it sendeth choler regularly to every gut, from one gut to another, to cleanse them from superfluities and dross.

Phlegm is made of meat not perfectly digested: it fortifieth the virtue expulsive, and maketh the body fit for ejection; it is kind to, and fortifieth the brain, by its consimilitude with it; it is antipathetical to the apprehension, and doth much injure it, therefore phlegmatic persons have but weak apprehensions: it is cold and moist in quality, its receptacle is in the lungs, it is governed by the Moon and Venus; therefore it qualifies the bile, cools and moistens the heart, thereby sustaining it and the whole body from the fiery effects which continual motion would produce.

Melancholy is the sediment of the blood: it is cold and dry in quality; it maketh men sober, solid, and staid, fit for study, or any serious employments; it curbs the unbridled passions incident to the sanguine complexion; it stayeth wandering and idle thoughts, and reduces them home to the centre; it is like a grave counsellor to the whole body. It is governed by the planet Saturn, it strengtheneth the retentive faculty, and its receptacle is in the spleen; which in the body is placed on the left side transversely linked to the stomach.

OF THE REINS AND KIDNIES.

THE REINS and KIDNIES are placed within the region of the nutrites backwards, and they are ordained

to cleanse the blood from the watery superfluities; they have two passages: by the one is drawn the water from the *vena kelis*, by two veins, which are called *venæ emulgentes*, the emulgent veins; and by the other is sent the same water to the bladder, and this is called *poros urithedes*.

The kidnies are made of a hard substance, and full of hard concavities, and therefore the sores of them are hard to cure; they are harder in substance than any other fleshy member, and that for two causes; the first is, that they be not much hurt by the sharpness of the urine; the other is, that the urine that passeth from them might be the better cleansed. The heart sendeth an artery to convey to them blood, heat, spirit and life. And from the liver there cometh a vein, which bringeth nutrimental blood. Their fatness is as of other members, made of thin blood congealed by cold, there is the greater quantity in this place, because it should temper the heat of the kidnies, which they have from the biting sharpness of the urine.

The next thing is the bladder, which is compounded of two nervous panicles; in complexion it is cold and dry; its neck is carnous, and hath two muscles to withhold and to let go; in man it is long, and is contained with the yard pasaing through the *peritonæum;* but in women it is shorter, and is contained with the *vulva*. The place of the bladder is between the share-bone and *longaon*. In women it is between the aforesaid bone and the matrix. In the bladder are implanted the uterus, which bring the urine or water from the kidnies thither, and enter into the holes and panicles thereof, which is done by a natural motion between tunicle and tunicle, till the urine findeth the hole of the nether tunicle, where it entereth privily into the concavity. And the more the bladder is filled with urine, the straiter are the panicles compressed together; the holes are not set one against the other, so that, if the bladder be ever so full, none can go back again.

This is the microcosmical ocean, into which all the rivers of the body discharge themselves. There must needs be more than a watery substance in it, for many times in diseases it is plentifully made, though the patient drinketh little or nothing; and it is observed that creatures that drink nothing will make water. Physicians oftentimes foretel many things by its colour, thinness, and thickness. Salt you know is hid in meats, and that plants have very much salt in them you may find by distilling them: and it is very well known, that by the chemical art kinds of salt may be fetched out of urine. The artificial *crysocolla* is made of urine. Nitre is made of earth moistened with urine and dung of living creatures.

OF THE GENERATIVE PARTS.

THE instruments of generation are of two sorts, male and female; their use is the procreation of mankind, the operation is by action and passion, the agent is the seed, the patient the blood. Although this cometh to be spoken of in the last place, yet it might have deservedly been put in the first; for nature regards not only the conversation of itself, but to beget its like and conceive its species. Venus hath the principal government of the members of generation, in which members there are many parts deserving our attention.

First; of the genitals of men:—The first thing to be considered is, that which anatomists call *vasa preparantia*, or preparing vessels, which bring blood and vital spirit to the testicles; they are four in number, and before they come to the testicles they make a curious implication, intertexture, or twisting, the one with the other, the arteries into the veins, and the veins into the arteries, which physicians call *corpus varicosum;* some call it *pompiniformis;* this interweaving reacheth down even into the substance of them; their use is to mix the blood and vital spirit together, that so they may have fit matter to work on.

The testicles are of a white, soft, and spongy substance, full of small veins and arteries; or else, when humours flow to them, they could not swell to such a bigness: their form is oval; of their bigness few are ignorant. Each testicle hath a muscle, which the learned call *cremaster*, which serveth to pull them up in the act of generation, as its name in the Greek signifieth, that so the vessels, being slackened, may better void the seed.

The seed being thoroughly concocted by the testicles, there are two other small pipes called *vasa deferentia;* they are also called spermatic pores: their office is to carry the seed to the seminary vessels, which are to keep till need requireth its expulsion. From the stones they arise very near to the preparing vessels into the cavity of the belly; then going back again, they turn to the back side of the bladder, between it and the right gut, where they are joined to the seminal vessels, which are soft and spongy, somewhat like kernels, through which passeth the *urethra,* or common passage in the yard both for seed and urine.

Histories make mention, and experience evinceth, that some are born without testicles, some with one. Philip Landgrave of Hessia, had three; he was so full of seed, and prone to venerous actions, that his wife could not suffer him so often as necessity urged him to it, he otherwise being chaste and honest; he, relating his mind to the priests, with the consent of his wife, took a concubine.

It is unnecessary for me here to describe the yard, and all the parts thereof, as their form, office, texture, sympathy, &c. will hereafter be more particularly treated of in the anatomical analysis: in this place therefore I only mean to give a brief touch of the most considerable parts.

I now come to the generative parts of women; and first of the *clitoris*, which is a sinewy and hard body much like the yard of a man, and suffers erection

and falling, causeth lust in women, and giveth delight in copulation: Avicenna calleth it the wand, or *albathara;* and Albucasis calleth it *tentigo:* and Fallopius saith, that this hath sometimes grown so big, that women would copulate with others like men: This observe, that the passage of the urine is not through the neck of the womb; near the passage of the urine are four caruncles or fleshy knobs: they are called *myrtiformes,* because they resemble myrtle berries; the uppermost of them is large and forked, to receive the neck of the passage of the urine; the others lie below this on the sides, and are to keep back the air or any hurtful thing from the womb. In virgins these knobs are joined together by a thin skin, interlarded with small veins, with a hole in the middle about the bigness of one's little finger, through which passes the menstruous blood: this skin is a note of virginity, for the first act of copulation breaketh it. I believe that this was that note of virginity which God gave to the Hebrews. These knobs joined together do much resemble a rose not quite blown, therefore called a flower, whence comes the word to deflower a virgin. If I should take upon me to declare the opinions of authors, it would prove (almost) an endless task; this I shall add, that I conceive it not a certain note of virginity, because it may be broken without the act of copulation; as, namely, by applying pessaries to provoke the menstrues, or by a defluxion of sharp humours, &c. but it is probable that the Jewish virgins were more careful of it, their reputation depending thereon.

The womb in figure is almost perfectly round, in virgins about the bigness of a walnut, yet, when a woman is conceived with child, it dilates itself to such a capacity, that it is able to contain the child, the mouth of it is no bigger than to receive the glands of the yard, yet at the delivery makes room for the child to come out, be it ever so big: this made Galen admire, and it may be a great admiration to all, if we

consider the wonderful works of God in the creation of man: he who knows himself may know there is an all powerful God! and therefore it was engraven with letters of gold over the porch of the temple of Apollo, the god (according to the Panims) of knowledge and wisdom, this sentence—*Know thyself*—as a salutation unto all; signifying, that he that would have access unto that divinity, and entrance into that temple, must first know himself.

The womb before conception is small, because the seed, being but little in quantity, might be closely embraced and cherished. Women have testicles or stones as men have, but they differ from men's in these particulars: they are within the belly in women, in men without; they are not so smooth in women as in men; they are less than the stones of men; they are not staid by muscles, but by ligaments; men's are oval, but women's are flattish; they have but one skin, men's have four, because they are without the body, and exposed to the cold they are more soft and cold than men's are. But they are ordained both in men and women for the same use, viz. to concoct seed; and, though Aristotle denied seed in women, yet Hypocrates, one of the ancients of physic, was of this judgment; and reason and experience confirm it.

The *vena preparantia*, preparing vessels, and *vena deferentia*, carrying vessels, are of the same nature and office as they are in men; they differ only in this, that they are somewhat shorter, having a shorter way to go, the testicles being within the belly in women: but, lest the shortness of the passage should hinder their operation, God and nature have so provided, that they are more twisted and interwoven than they are in men, that they may the better mingle the blood and vital spirit.

Thus have I given you a short description of man, the master-piece of God's workmanship; and in whom is comprised a small draught of all things in

the universe. In man, as in a perspective glass, may our mother-earth with her innumerable offspring be discovered; in him may the unruly and restless waves of the ocean be delineated: nor doth he only epitomize the elemental world, but also the celestial; in him are discovered the prudent, majestical, sumptuous, magnificent, honourable, affable, and humane solar quality: the unsteadfast, timorous, soon-daunted, oft-changing, and shifting, temper, among men, answers to the various motions of the low and oft-changing Luna. Others in profundity of imagination, reservedness of words, austerity of actions, &c., are a fit portrait of the melancholy planet Saturn. There are yet a few in the world who are faithful lovers of fair dealing, beneficent to all men, doing glorious, honourable, and religious actions; just, wise, prudent, virtuous, &c., of the temper of benevolent Jupiter. There are (in our apprehensions,) too many of the martial temper, who are valiant lovers of wars, frays, and commotions, subject to no reason, bold, confident, willingly obeying nobody, &c. Nor is Venus excluded these people's affections who love mirth in words and actions, musical, delighting in venery, drinking, and merry meetings, who trouble not themselves with state affairs, nor are inquisitive after armies or navies. Nor is Mercury without his party among us, who are subtle and politic, excellent disputants and logicians, sharp-witted, and able to learn any thing, men of unwearied fancies, and fit for any employment, yet unconstant. The planetary influence in the good or ill disposition of the air is lively represented in man. A healthy sanguine constitution, or a delicious composure of heat and moisture, answers to a serene and temperate air, with seasonable moistening dews and showers, which are the sweet influence of the Sun, Jupiter, and Venus. The feverish, hot, and parching distempers of the body, answers to the hot and scorching weather occasioned by the fiery beams of Mars. Nor is the cold, chill, melan-

choly, weeping, and lamenting disposition of many people, less represented by the melancholy, dark, cold, and wet weather, proceeding from Saturn's influx. The intellectual world, has also in man its portraiture; witness the soaring contemplations of the soul of man, which cannot (like the body) be confined to any place, but in a moment surrounds this terrestrial globe; nor there content, but as soon mounts itself to the heavens, and searcheth their secret corners; nor there satisfied till he comes to the highest, for by his contemplations (having its original from the uncreated light,) he reflects hither, viz. to the divine Majesty of heaven!

ANATOMICAL ANALYSIS

OF

THE HUMAN FRAME.

OF THE SKIN.

THE SKIN is a membranous covering of the body, similar, spermatic, having blood mixed with it, reddish, white, loose, and the instrument of feeling. It hath cutaneous veins and arteries, as also nerves; from the last of which, it receives its quickness of sense. From the capillary veins and arteries, it receives blood for nourishment, and vital spirit for quickening. Its temperature is cold and dry, or rather exquisitely temperate, yet so that it may be the judge of feeling. The skin on the top of the head is thickest, that on the side, thin, that on the face and

palms, thinner, that on the lips thinnest of all; that on the tops of the fingers is mean, so that the sense of touching may be more perfect; its texture is slight and very full of small holes or pores, for the insensible transpiration of fumes, vapours, and sweat. It takes its colour from the predominant humour, unless it be such from the birth, as in Ethiopia. It has a double substance: the one is external, called *cuticula*, or the scarf-skin, because it is placed upon the skin, as a cover or defence, every-where perfoforated with pores, without blood and without feeling: its connexion is to the true skin, from whence it has its figure and colour; but in blackmoors, the *cuticula* being pulled off, the skin itself is white. It has no action only use, which is to shut the pores of the skin that the ichorus substance may not issue from the veins and arteries; to defend the skin from immoderate heat or cold; and to make it smooth, beautiful, polished, and even. It is generated of a vicious and oleaginous vapour of the blood. The other is the true skin of which we have first spoken, which is six times thicker than the scarf-skin; its pores will appear in winter time, if it be made bare, and exposed to the cold; for where they are, the *cuticula* will appear like a goose skin. The skin receives two cutaneous veins, through the head and neck, from the jugulars: two through the arms, breast, and back from the auxiliaries: two through the lower belly, loins, and legs, from the groins, which are conspicuous in women after hard labour, and in such as have the *varices* in many branches. It has few arteries, and those very small, in the temples and forehead, fingers, scrotum and yard.

OF THE FLESH.

THE FLESH is a similar, soft, thick substance, well compacted, made of blood alone, if it be red, but of blood and seed if it be white. It is four-fold, viz., musculous, viscerous, membranous, and glandulous;

of which the two first are very red, but the two latter white. Musculous flesh is soft and red, and that which is properly termed flesh. Viscerous flesh is that of the bowels, which is the proper substance of the lungs, heart, liver, spleen, and kidnies; it is red, hard, fitted to prop up the vessels, and to assist them in their particular and various operations. Membranous flesh is the fleshy substance of every membranous part, as in the gullet, stomach, guts, womb, bladder. Glandulous flesh is the flesh of kernels; it is white, thick, and spongy, formed of seed, (and therefore cannot properly be called flesh,) of which some anatomists make many diversities, but the true searcher may find the glandules differ not so much in substance as in their use and humour; which are, first, to support the divisions of the vessels; secondly, to drink up superfluous humours, because they are of a hollow, spungy substance, and are therefore vulgarly termed *emunctories*, or cleansers of the noble parts, those in the neck being accounted cleansers of the head, those in the arm-pits, of the heart, and those in the groin of the liver: thirdly, to moisten the parts for their more easy motion, or to prohibit dryness, such are those which are situated by the tongue, larynx, eye corners, &c.

OF THE MEMBRANES.

A MEMBRANE is a similar, spermatic, part; broad, soft, dilatable, white, containing and investing the parts, and carrying sense to them. If, being a hollow body, it receives something, as the stomach, bladder gall, eye, it is called *tunica*, a coat; but if it embraces and covers a solid body, it is called *membrana*, a covering: and those which cover the brain are called *menings*. It is endued with sense from itself. Membranes are the only true organs of feeling, serving the animal spirits to this purpose. Their use is, to invest the parts of the body, to defend it from injuries by reason of their hardness and

compactness, to give them the sense of feeling, to strengthen them, to join parts to parts, and to keep them united; to separate also the parts, and to close the mouths of the vessels. Some membranes are thin, some thick: the thin membranes also differ; for the *periostion* of the ribs is thinner than the *pleura*; the *periostion* of the head is thinner than the *pericranium*; the *pia mater* is thinner than the *dura mater*. The proper membrane of the muscles is thin, and is knit unto the muscles by most thin filaments; its use is to clothe the muscles, to separate them one from another, and to impart to them sense and feeling. The thick membrane is called by some a membranous muscle, by others a nervous or fatty coat; it is called fleshy because in some places, as about the loins, neck, ears, forehead, &c., it retains a fleshy substance; but in the abdomen of a man ripe in years, it has no fleshy appearance at all. Its temperature is hot and moist, having its origin from the blood: it is situated under the fat, and stretched out over the whole body universally, and is the fourth covering of the body, (but in beasts it is next to the skin:) it has no figure but that of the body which it covers: its colour is various in divers places: in the neck, forehead, and privities, it is redder than elsewhere: in some places it is joined to the fat inseparably, in other places it may be separated; and it communicates with the principal parts by the extremities of the veins, arteries, and nerves. It is very sensible, so that the rigour and trembling of the body depend thereupon: its use is to give foundation to the collecting and generating the fat, and to keep the fat in its due place, as also to divide one muscle from another, and all of them from the other flesh; to clothe the body, cherish the internal heat, and to defend it from external injuries: it sticks close to the fat, to the muscles, and to the ligaments of the bones, and is firmly joined to the back in fashion of a membrane, from

whence it is said to arise; it is so closely joined to the *musculus latus*, that in the neck and forehead it can scarcely be separated from it, whereby it is thought to constitute the same: to the skin it sticks by very many veins, some few arteries, branches of nerves, and an innumerable quantity of membranous fibres.

OF A FIBRE.

A FIBRE is a similar spermatic part, dispersed through the skin, flesh, and membranes, to make them the more firm, and being naturally distended, to contract again in the same manner. By reason of the various situations thereof, it is said to be either right, oblique, transverse, or round, whereby it may not only help the membrane, but strengthen it, as also the skin and flesh of muscles; and, when dilated, reduce them to their natural state. Each sort of fibre is said to perform a several action: as the right to attract or draw to; the oblique to expel or thrust forth; the transverse to retain or hold; and the round to constrain or bind. But these actions of the fibres are not made so much by their own singular virtue as by the virtue of the member which they serve, or belong unto, from which they have their sense and nourishment; for of themselves they are senseless.

OF A LIGAMENT.

A LIGAMENT, or band, is a similar, spermatic, dry part, adhering firmly to the bones, tying the parts of the body mutually together. Its substance is solid, white, bloodless, softer than a gristle, and nerves and membranes; being of a middle substance between them. It is without cavity, sense, or motion: their substance is in some places softer and more membranous than others, as in all ligaments which go about the joints. Their use is like a cord to connect or bind the parts of the body one to ano-

ther, chiefly the bones, and to keep them together, that they may not be luxated or disjointed. As to situation, some are within or among the bones, as the gristly ligaments, which are thick and round: some are externally wound about the bones, which are thin and membranous. As to figure, some are broad, which are called membranous: others round and nervous: but they are called membranous and nervous only in respect to their external form or resemblance, not to their internal essence; for they are all void of sense, which they would not be, were they composed of the true substance of a nerve or membrane. All the ligaments are solid, none are hollow, except the slender ligaments of the womb.

OF A CARTILAGE OR GRISTLE.

A GRISTLE is a similar spermatic part, drier and harder than a ligament, but moister and softer than a bone, rendering the articulation the more pliable, and defending several parts from external injuries. Some are softer, especially about the joints; others harder, and not much differing from the nature of a bone; and some are in process of time turned into bones, especially in aged people. It is without marrow, cavities, or sense, being endowed neither with nerves nor membranes. Its matter is the same with that of the bones, being a moist, earthy part of the seed, partly clammy and gluey, and partly fat; but more viscous than fat: its use is to facilitate motion, that the bones rubbing one against another should not wear and fret; to defend some parts from external injuries, itself being scarcely subject to any: to shape parts prominent or hollow, as in the ears, *larynx*, &c., to fill up hollowness in the joints as in the knees; to serve for a cover, as in the *epiglottis;* to sustain or underprop, somewhat, as the gristles of the eye-lids to bear the hairs; and to make a connection or joining of the bones. Their situation, magnitude, and figure, are various, accord-

ing to the bones they are joined with; their substance is sometimes harder, as those which in time become bony; sometimes softer, resembling a ligament, and are therefore called gristly ligaments; yet, though hard, they are flexible and tough, because encompassed with viscous slimy matter. As to their connection, some constitute parts in themselves, as that of the nose; others grow to the bones which knit them together, without any other medium, as in the share or breast bones; or by common ligaments coming between, as in that joining called loose articulation.

OF A TENDON.

A TENDON is a similar, spermatic, solid part, cold and dry, having a peculiar substance, continued from the beginning to the end of a muscle, and the chiefest part thereof upon which the action of the muscle depends, and no where to be found out of a muscle It has a nervous-like substance, yet extremely differing from a nerve; white, thick, hard, smooth, and extending according to the length of a muscle, being ten times bigger than a nerve. Its figure is either solid and round, as in the *musculous biceps;* or plain and membranous, as in the muscles of the abdomon; being also either short or long, and of a uniform substance in all its parts; so that if it is nervous at the beginning, so it is at the end; but sometimes it is nervous at the end when the head of it is fleshy; and if its beginning is like small strings, they are united to form the tendon afterwards. The hard and stiff tendons have much fat about them, to soften them, that they may be more pleasantly moved, and therefore those fibres dispersed among the flesh are nothing else but the tendon divided, and the tendon nothing else but fibres united; and therefore a tendon is either solid, compact, and united, or esle disgregated, severed, and divided into fibres. United is where the whole tendinous part appears white, and

hard, either in the beginning, end, or middle, or in all those parts. Severed or divided, when produced into innumerable small fibres, scarcely discernible to the sight, being compassed about with flesh.

OF THE FAT.

FAT is a similar, soft, oily, white, insensible part; made to preserve the natural heat, to help chylification, to facilitate motion, to moisten other parts, and to nourish the body in famine. Its substance is twofold, viz. grease and suet, which although it is somewhat solid, yet it is soft and oily, as may be perceived by handling: grease or *axungia*, is easily melted, but not so easily congealed; *sævum* or suet is not so easily melted, but more easily hardened. Its origin is from the thinner parts of the blood, sweating through the veins like dew, and congealing about the flesh: this is the essential matter of fat; its efficient cause is a moist and temperate heat, (which is also the quality thereof;) the cause of its congealing is the coldness of the membranes from whence it has its white colour: but this coldness is not simple, but respective to other parts. Melted lead or wax will congeal in hot places if the heat be less than that heat which will melt them; hence Galen determines fat to proceed from coldness; so that the fat, thin, and light, part of the blood, in colder constitutions is reserved: whilst in hotter bodies it turneth to nutriment, so that hot and dry bodies are hardly ever fat. Its situation is immediately under the skin, universally over the whole body, the forehead, eyelids, and privities excepted: whence it is that the fatty membrane is as large as the skin, and sticks firmly to it, neither can it be divided from it without scraping; and so also it sticks to the fleshy membrane. It cannot communicate with the principal parts, because it is not truly nourished; nor yet lives unless by opposition, as stones do, nor is it indeed sensible; therefore it wants both veins, arteries, and

nerves, yet all three of them pass through it to the skin. The fat of the belly has three veins; the external mammillary descending from above; the *vena epigastrica* arising from beneath, or out of the crural vein, through the groin; and that coming out of the loins, having many veins accompanied with arteries; through these and the vessels of the skin, cupping-glasses, and scarifications, draw humours out of the inward parts. It has a great number of kernels, which receive excrements out of the body into themselves: and they are more numerous in sickly persons, and such as abound with excrementitious moisture. Its uses are to cherish the natural heat: to help the concoction of the stomach; moisten hot and dry parts, such as the heart; to facilitate motion in the principal parts, as in the gristles and jointing of the greater bones, and about certain ligaments, as also in the socket of the eye, lest by its continual motion it should become dry and withered; to serve as a pillow or bulwark against blows, bruises, and contusions, and therefore the palms of the hands. buttocks, and soles of the feet, have plenty of fat; to nourish the body in time of long fasting; to fill up the empty places in the muscles, and to underprop the vessels, that they may pass safely; and lastly, to fill up all the vacuities of the other parts, vessels and skin, that the body may be rendered smooth, white, soft, fair, and beautiful.

Hitherto we have treated of parts absolutely similar; those which are so only in appearance or to sense, are in number five, viz., veins, arteries, nerves, muscles, and bones; of all which we shall now treat in order.

OF VEINS.

A VEIN is a similar, spermatic, membranous, round, long, hollow part, every where joined by anastomoses to the arteries; allotted to receive and contain the blood from them, to be farther concocted, and to be

carried to the heart and liver, and to distribute it over the whole body. The original of their dispensation, or place from whence they rise, is the liver, where blood is made; and that the first sanguification is made there, and not in the heart, is apparent, because there are no passages to convey the chylus to the heart, nor any receptacles for the excrements of the first concoction placed by the heart; all which requisites are found by the liver. Moreover blood is carried from the liver to the heart, but not from the heart to the liver: for it cannot go out of the heart into the liver, because of the valves, though immediately, when it runs back out of the arteries, it may be carried thither. Also the *vena cava* and *porta* enter not into the heart, but the liver; and, in a child in the womb, the navel-vein with blood (which nourishes the child) goes not into the heart, but into the liver; nor is sanguification ever hurt but when the liver is hurt. The veins have only one tunicle, with many valves within, especially in the external joints; they are nourished with blood, not with that contained within themselves, but with that from the little arteries; for their connexion is such with the arteries, that every vein is for the most part attended with an artery, over which it lies, and which it touches. Galen saith, a vein is seldom found without arteries: but no artery is ever found without a vein. Their form is that of a conduit-pipe: their magnitude, according to their place: in the liver, and their original, they are great, because they are hot, soft, and in perpetual motion, and because all the blood in the body passes this way, out of the right, into the left ventricle of the heart: in the heart they are great by reason of its heat, and because it is to furnish the whole body with arterial blood, received in, and sent out, by continual pulsations. The emulgent veins are great, because of the plenty of blood, and serocities, brought back from the kidneys to the vena cava: but where the substance

of the part is lasting, and the heat small, the veins are less, as in the brains, bones, &c. and in all parts towards their ends they are very small, and called capillary veins, being divided minutely, sprinkled into, and for the most part, confounded with, the flesh; by this way the arterial blood is mediately passed through the porous flesh to the veins: and, by the same way also, blood made of chyle in the liver is infused into the little branches of the vena cava. The veins and arteries conspire together, and the veins receive out of the arteries, spirit and blood; and this is apparent, because, if the veins be quite emptied, the arteries are empty also: moreover, by a vein opened in the arm or hand, all the blood in the body may be drawn out; also it is necessary in respect of the circular motion of the blood; and in many places it may be demonstrated to the eye-sight, where the conjunction of the veins with the arteries are visible. The veins are endowed with feeling both from the nerves that are near them, and from their own membrane, which is one only, where they are inserted into some bowel; otherwise they are besides invested with a common membrane, or some external thick one, borrowed from the neighbouring parts, when either they are suspended and carried a long way without the bowels and muscles, or when they rest upon hard bodies. This happens in the abdomen to the veins and arteries from the *peritonæum;* and in the chest from the *pleura.* Their use is to receive the blood not sufficiently elaborated from the arteries, and to return it to the liver and heart, there to be more perfectly concocted. For neither is the venal blood, nor do the veins carry any thing useful for nutrition; but they bring back all the blood to the heart, only by circulation, either mediately by the liver, as the meseraic veins, or immediately, as the *cava;* and that either from the whole body, from the smallest branches to the greatest, by the upper and lower branch, or from the liver, whether it be there gener-

ated, or is derived from the meseraics and arteries. Hence it appears, that the veins carry and re-carry the blood to the liver, and to this end the valves of the veins do conspire, which are so contrived, that they stand all wide open towards the heart, and afford an easy passage from the smallest veins to the greatest, and from thence to the heart, but from the heart and great veins being shut, they suffer nothing to go back. The liver sends only to the heart, the heart only to the lungs and all the arteries. Seeing therefore the blood is thus sent into all parts, and cannot now be instantly repaired by diet, nor return back to the heart by the mitre fashioned valve of the aorta; nor abide still in the arteries, which are continually moving forward the same; nor lastly, that there can be so much spent by the parts to be nourished: it necessarily follows, that what remains over and above is brought back again to the heart, and enters the veins by circulation. The substance of the veins is membranous, that they may the more easily stretch and shrink in again: they have only one tunicle which is proper to them, which is thin and rare: it is so thin, that through it the blood may be received after the parts are nourished, and so be re-carried to the heart, to be there again perfected. The valves of the veins are little foldings, or gates: they are made of moist thin little membranes in the inner cavities of the veins, and certain particles as it were of the coats of the veins: they are situated in the cavities of the veins chiefly of the limbs, viz. of the arms and legs, after the glandules of the arm-holes and groins, beginning presently after the rises of the branches, but not in the rises themselves; nor is there any of them in the external small veins, because they need them not, nor in the jugulars, (except two in the inner orifice, looking from above downwards,) because the blood doth hardly descend upwards; nor in the *vena cava*, because the valves in the divarications do sufficiently hinder the regress of the

blood; they are also found in the emulgents and the branches of the mesentary, looking towards the *vena cava* and *porta*, as also in the milky veins. They all of them look the same way, one after another, towards the heart: and are placed at convenient distances, as two, three, four, or five fingers between each, according to the length of the vessel. As to their magnitude, they are greater where the plenty and recourse of the blood is most vehement, being in form like the nail on a man's finger, or the horned moon, as the sigma-shaped valves of the heart; and in their substance exceeding thin, but very compact, lest they should break by a strong intercourse of blood. The uses of the valves are, 1. To strengthen the veins, whereas the arteries are otherwise made strong by the double coats. 2. To stop the too violent motion of the blood, lest it should flow more violently out of the great veins into the little ones, and tear them. 3. To hinder the blood from regurgitating, or going backwards. Hence the cause of a *varix* is apparent, because thick heavy blood long retained against the valves makes a ditilation; for without the valves the veins would swell uniformly and all of an equal bigness, and not in the manner of *varices*.

The chief veins of the whole body are of three kinds; first, the *vena cava;* secondly, *vena porta;* thirdly, *venæ lactæ;* from which several other eminent veins arise, having particular denominations. The *vena cava* or *magna* is so called because of its largeness, being the greatest in the whole body, and the orignal of all other veins which do not proceed from the vena porta. It takes its beginning from the liver, where, having spread many veins through the upper parts thereof, they are about the top collected into one trunk, which is presently divided into two parts, viz. the upper or ascending trunk, and the lower or descending trunk.

The ascending trunk of the vena cava, which is the greater, perforates the *diaphragma* or midriff,

and is spread through the breast, neck, head, and arms. It is carried undivided as far as the *jugulum*, and has four branches; viz. 1. *Phrenica vena diaphragmatica;* the midriff veins, on each side one, which send their branches to the *pericardium* and *diaphragma*. 2. The *vena coronaria*, which is sometimes double, encompassing the basis of the heart, at whose rise a little valve is placed to hinder the blood returning to the trunk; and with a continued passage it is joined to the artery, that it may therefrom receive the blood, which is to return to the cava. 3. *Azygos sine pari*, the solitary vein, sends chief intercostal branches to the eight lower ribs arising about the fifth vertebra of the breast, from the hinder part of the *vena cava;* then about the fleshy appendices of the diaphragma, it enters the cavity of the abdomen, where on the left side it is inserted in the emulgent vein; on the right side into the trunk of the cava. 4. *Sabclavii*, or branches of the cava by the channel-bones, are divided into only two branches, one on each side: each of which are divided into two others, called the *subclavii* and *axillaris*. From the *subclavii* come forth two several branches, a superior and inferior. From the superior proceeds, first, the *muscula superior*, spread out into the skin and muscles of the hinder part of the neck: secondly, the *jugular veins*, by the side of the neck; and they are either external or internal. The external jugular creeps up to the neck, chin, head and face: under the root of the ear it is divided into internal and external branches; the internal goes to the muscles of the mouth, fauces, hyoides, &c.: from this branch spring the veins which are opened under the tongue. The external is propped with kernels, and is divided into two parts: the one is carried to the fore parts of the face, cheek, and nose; and in the middle of the forehead, being joined with a branch of the other side, it makes the vein of the forehead; the other is carried through the sides, the temples, and the *acci-*

mut. The internal jugular is called the *appoplecta*, and ascends to the side of *trachea*, to which it sends branches: and, going to the basis of the skull, in its hinder part, it is divided into two branches; the greater of which is carried backward through the hole of the *os occipitus*, and enters into the cavity of the *dura mater*, or thick meninx of the brain: the last enters in at the hole or *sinus* of the third and fourth pair, and is carried also to the *dura mater*. From the inferior branch, proceed five veins, the *mammaria*, *intercostalis superior*, *mediastina cervicalis*, and *muscula inferior*.

The *vena axillaris*, or arm-vein, when it comes to the arm-pit, is divided into two veins, viz., the *vena cephalica*, or upper branch; and the *vena basilica*, or lower branch, to which is added the *mediana*. The *cephalica*, or head-vein, is carried in the surface of the body between the fleshy membranes and coat of the muscles. The *basilica*, or liver vein, is placed near a nerve of the third and fourth pair; and therefore surgeons in opening of it ought to be careful, lest they wound it, from whence follow great pain, fever, convulsion, and death. From the *basilica*, or lower branch, arise two veins; first, *thoracica superior*, which goes into the muscles of the chest, and into women's breasts: secondly, *thoracica inferior*, which sometimes grows out of the superior, creeping all over the side of the chest; its branches are joined by anastomosis with the branches of the *ozygos*, which proceed out of the chest. The *basilica* is divided (under the tendon of the pectoral muscle) into three branches: the first goes with the nerve of the arm, the second is divided into an external, which sends veins to the thumb, fore and middle fingers; and an internal running along the middle bone of the cubit, sending branches along the fingers to the internal muscle of the hand, the third, called *subcutaneus*, at the inner swelling of the arm, is the inner branch of the *cephalica*, which constitutes in part the *mediana*.

The descending trunk of the *vena cava*, which is smaller and narrower, proceeds undivided as far as the fourth vertebra of the loins; and sends forth the four following branches. 1. *Venæ adisposæ*, which furnish the coats of the kidnies, and their fat, the sinister being commonly higher than the dexter. 2. The *emulgens*, or emulgent veins, descending to the kidnies by a short and crooked passage, bringing back the blood, being purified, from the kidnies to vena cava. 3. The *spermaticæ*, or spermatic veins, the right arising a little below the rise of the emulgent; and the left arising from the emulgent, seldom from the cava, sometimes from both. 4. *Lumbaoes*, or loin-veins, sometimes two, three, or four, which are carried between the four vertebra of the loins. 5. After these branches the trunk goes towards the *os sacrum*, and at the fourth vertebra of the loins it goes under the aorto, and is divided into two branches, called *rami ilii*, or *iliaci*, because they go over the *os ilii*, and *os pubis*, to the thigh: these iliac branches as soon as they have left the cavity of the belly, are called *vena crurales*, or the leg veins.

From the *rami ilii* arise two veins: first, *muscula superior*, which sends veins to the *peritoneum*, and muscles of the loins and belly; secondly, *vena sacra*, which is sometimes single, sometimes double, for the marrow of the *os sacrum*. From thence the *ramus iliacus* is forked out on each side into the external greater and internal smaller. From the internal smaller proceed two veins: first, *muscula media* without, which sends veins to the muscles on the outside of the hip and skin of the buttocks; secondly, *hypogastrica*, which is sometimes double, sending veins to many parts of the hypogastricum, as to the bladder and its neck, to the penis or yard, or the muscles of the intestinum rectum, whence are the hemorrhoides externæ, and to the lower side and neck of the womb, whence are those veins by which the courses flow in maidens and women with child; but when

the courses are naturally voided, they flow from the arteries, as appears from their excellent colour and the common office of the arteries. From the external greater proceed three veins: 1. *Epigastrica*, which sends branches to the peritoneum, and muscles of the abdomen: the principal parts ascend under the right muscles to the mammariæ, with whom they are often joined about the navel. 2. *Pudenda*, which sends to the privities in men and women, and goes across to the middle of the os public. 3. *Muscula inferior*, which, passing over the hip, serves the muscle and skin of the part; from hence downwards the iliac branches, as soon as they have left the belly, are called *crurals*.

The *crural veins* are interwoven with little glandules in the bending of the thigh, and from them proceed six branches. 1. The *ischias* or *ischiatic minor*, which is opposite to the *saphœna*, and serves the skin and muscles of the hip. 2. *Ischias* or *ischiatica major* sends branches to the hip, and a part of the muscles of the calf, and then divides itself into ten branches, bestowing a couple upon each toe. 3. *Poplitea*, the ham-vein, made of a double crural branch, mixed together: it runs strait under the skin behind, through the midst of the bending of the ham to the heel, and sometimes to the skin of the external ancle. 4. *Suralis*, a great vein, and is divided into the external and smaller and internal and greater; and each of them again into exterior and interior: all which send veins to the muscles of the calves of the legs. Those on the back of the foot, being mixed with the *Poplitea*, make the same various textures of veins, which are seen under the skin. 5. *Sepœna*, (so termed from its apparency,) or *vena maleoli*, the ancle-vein, is long and large, carried on through the inside of the thigh, between the skin and membrana carnosa, to the knee; and from thence by the inner part of the leg, it runs to the inner ancle, and to the upper part of the foot and toes. 6. The *muscula*, a

vein arising from the trunk or branch hidden among the muscles: it is double, and remarkable, giving veins to the muscles of the thigh. As to the veins of both arms and legs, it is to be noted; first, that their various branches send divers twigs outward to the skin, called cutaneous veins: secondly, that even the grand branches are variously distributed in every person, being seldom in one man as they are in another: and that the right arms or legs rarely agree with the left. In opening the veins of the foot, you may indifferently make choice of any, seeing they are all derived from one, and the same trunk.

The *vena porta*, or gate-vein, is the next great vein to the cava; its prime original is the *vena umbilicalis*, or navel vein, the first of all the veins arising from seed, and that by which the child is nourished in the womb; afterwards it rises out of the hollow part of the liver, where with many roots it is inserted. The trunk, before it is divided into lower branches, sends two small veins to the gall-bladder, called *venæ cysticæ*; and another vein to the stomach, called *gastrica dextra*, which is divided about the lower orifice of the stomach. Afterwards the trunk is divided into two eminent lower branches, viz. the splenetic and the mesenteric. *Ramus splenèticus* goes into the spleen. Before it is divided, it sends from itself two upper branches to the stomach; first, *gastrica sinica* or *major*, (the largest of all the stomach veins,) which afterwards constitute the *coronaria*; then it sends lower branches, one to the omentum or caul, and one to the pancreas. Afterwards the trunk of the ramus splenicus, is divided into the upper and lower branches; the former produces the vas breve and other little branches carried into the spleen: the latter produce, 1. *Gastroepiploica sinistra*, which runs out upon the bottom of the stomach, and gives many branches both to the stomach itself, and to the omentum. 2. *Vena epiplois*, which runs out upon the same parts; and a mul-

titude of other small branches which are sent up and down all over the spleen. The mesentric branches of the *vena porta* called *ramus dexter*, whose principal part goes into the mesentry, sends forth two veins; one to the middle of the *duodenum*, from whence certain capillary twigs go through the pancreas and omentum upwards; and another to the right side of the stomach and omentum. Afterwards the trunk of the *ramus mesentericus* is divided into two parts, the right and the left. The right hand branch is twofold: 1. *Gastroepiploica dextra*, which runs to the bottom of the stomach, and joins with the *gastroepiploica sinistra*, sending branches through the omentum and stomach. 2. The right mesentric branch itself, which is divided into fourteen nameless little branches, and those again into innumerable other little veins, which are called meseraic veins, and are dispersed into the *jejunum*, *ileon cæcum*, and part of the colon. The left hand mesentric branch, first sends out the *vena hæmorrhoidalis interna*, which diffuses itself through the mesentary, and sends forth branches to the spleen, womb, and intestinum rectum, which is the internal hæmorrhoidal vein: hence appears a communion between the womb, and the hæmorrhoidal of the anus, and that possibly the courses or terms may be conveyed also this way. Afterwards this left mesenteric branch spreads itself abroad into the left and centrical part of the mesentary, whence comes *vena cæcalis*, which goes to the blind gut; and *ramus mesocolicus*, which from the left side of the stomach goes to the colon. *Vena cava* first receives the cruder blood from the arteries, and remits it to the heart: the *vena porta* takes the blood not sufficiently elaborated from the arteries, and carries it to the liver, for the more perfect concoction and separation of the choler.

The *hæmorrhoidal veins* are situate in the fundament or *intestinum rectum*, and are of two kinds,

either internal or external. The internal proceed from the *vena porta*; the external from the *vena cava*, with which the hæmorrhoidal arteries are associated, and through which the humours to be evacuated are carried off. In their evacuation, the internal have a flux not very plentiful, attended with a great deal of pain; the external emit a flux so large as may sometimes cause death, or some grievous disease, but without any pain at all. The internal descend alone, not associated with arteries; however, the arteries are either hidden, or they depend on arteries not far off: the external descend with arteries to the muscle of the anus: and therefore the external hæmorrhoides may more properly be called *vasa hæmorrhoidalia*, whereby the arteries are included with the veins.

The *venæ lactæ*, or milky veins, are peculiar passages, much differing from the meseraics; they are called *lactæ*, from milk, which they resemble in whiteness, softness, and fatness. Their situation is in the abdomen, where they are for the most part accompanied with fat, to cherish the natural heat for the attraction and concoction of the chylus. The great lactean vein, lying between the *arteria aorta* and the vertebra of the loins, covered with fat, runs upward, and above the heart, ascends by the gullet by the left subclavian vein, where it ends in one, two, or three branches: here a most thin valve occurs at the very end of the vein, looking inwardly, that the chyle might not run back again, or run farther into the arm: out of this subclavial they descend by the ascending trunk of the *vena cava* into the right ventrical of the heart, that there, by the help of the heat and the natural faculty, they may be changed into blood. Their substance is the same with that of a vein itself, which it resembles in all things, the milky juice only excepted: having but a single membrane, though in the mesentary they receive from it another external coat. They grow continually one to another, of an unequa

magnitude; being for the most part small, lest the thick and unprofitable parts of the chyle should go into them, or lest they should make a distribution thereof too suddenly: they are also infinite in number, dispersed through the liver, mesentery, pancreas, and bowels. They are colder and moister than the ordinary veins: very thin, exceedingly subtile, (where they enter into the body of the liver,) tender, smooth outwardly, rare, but rough by reason of the fibres within them. Their action and use are, 1. To carry or convey the chyle to the liver. 2. To digest and better concoct the chyle, to make it more fit to receive the form of blood in the liver: for the chyle is not changed at all till it comes to the liver, where it grows red by little and little. 3. To shew a ready way for the distribution of the chyle: that the blood is made in the liver, not in the veins; and that the sucking of the veins is no cause of hunger, because none are carried to the stomach. To shew the causes of some diseases, before obscure: as of the chylus flux, of hypocondriac melancholy; of an atrophia, or pining away of the body for want of nourishment, by reason of the glandules of the mesentery being filled with scirrhus swellings; of intermitting agues quartered in the *mesarœum*, &c.

The best method of tracing the general course of the veins, is to begin with the main trunk or primary veins, and end with their ramifications and capillary extremities, according to their several divisions and subdivisions. In this manner they are traced in the annexed Plate, where fig. 1. represents the veins as attached to the body; fig. 2. the veins abstracted from the body; and fig. 3. the pulmonary vein: of each of which the following is an explanation.

1. Vena cava, (fig. 1 and 2)
2. Cava descendens
3. Cava ascendens
4. Vena axygos
5. 5. Subclavian veins

6. 6. Jugular veins external
7. 7. Jugular veins internal
8. The intercostals
9. 9. The mammary
10. 10. Auxilary veins
11. 11. Cephalic veins
12. 12. Basilic veins
13. 13. Vena mediana
14. 14. Diaphragmatic, hepatic and renal or emulgent veins
15. 15. Spermatic and iliac veins.
16. 16. Hypogastric, epigastric, and crural veins.

Fig. 3. represents the pulmonary vein in the time of expiration; *a*, being its trunk, cut close to the base of the heart; *b*, *b* its division to the right and left lobe of the lungs; *c*, the canalis arteriosus; *d*, *d*, the extremities of the arteries freed from the vessicles of the lungs, and their inosculations with the pulmonary veins.

OF THE ARTERIES.

An Artery, is a similar, spermatic, membranous, long, round, hollow, part, a common pipe like organ, consisting of a double coat proceeding from the heart, joined every where to the veins, by the assistance of many osculations, containing and carrying the nutritious blood and vital spirits to all parts of the body. It is called arteria, from its containing and preserving air or spirit, and therefore the ancients, as Hypocrates, Plato, and Aristotle, call the wind-pipe *arteria magna:* but Galen makes a distinction, and calls the windpipe *aspera arteria*, the rough artery, and those of which we here speak *arteriæ leves*, the smooth arteries, which Aristotle calls sometimes *venam aortam*, and sometime simply *aorta.* Their matter is a cold, clammy part of the seed: the original of their dispensation is the heart, and they proceed out of the left ventricle thereof, and not the middle, (as Aristotle would have it;) and therefore

the aorta, or *arteria magna*, proceeds particularly from the left ventricle; but the *pulmoniac arteria* (falsely called by the ancients *vena arteriosa,)* from the right ventricle. Their use is, first, to carry the vital blood and spirits, made in the heart, to all parts of the body: secondly, to breed animal spirits in the noble ventricle of the marrow, (to wit) the brain: thirdly, for the nourishment of the body and all its parts, which are only nourished by the arterial blood, and not by the venal: fourthly, to carry the excrements of the body and blood, either to the outward parts of the body, or to the kidnies, or mesentery or womb, or hæmorrhoidal veins, &c. The arteries flow only by pulsation: whereby, first, the heat of the parts is cooled and tempered: secondly, the nourishing arterial blood is cast continually into the smallest and most remote arteries: which is proved by the continual pulsation of the heart which drives the blood into the greater arteries: thirdly, the stagnation of the venal blood is thereby prevented; for the pulsation keeps it always in motion, by forcibly casting the more than necessary arterial blood for nourishment into the veins, which convey it to the heart for supply, lest it should be destitute of its sanguine humour for its continual expulsion. The cause of the pulsation, or pulse, is, according to Bartholine, both from the blood filling, and the faculties of the arteries directing. But I judge the cause to be from spirit, wind, air, or breath: for, if you blow with a reed or pipe being put into water, it will make an apparent pulsation, or bubbling, much more if the water was contained in long narrow vessels with valves, that it might not return back; but, if you suck with the pipe, then it runs smoothly, without pulsation or leaping: therefore the blood in the arteries, flows with pulsation, from the expulsive faculty of the heart, caused by its spirits; but flows in the veins smoothly, or without pulsation, because it is sucked or drawn back again by

the attractive faculty, caused by want of spirits, or blood, or by their being wasted by the heart's perpetual expulsation. The situation of the arteries is deep, always under the veins both in the external and internal parts, the abdomen, a little below the kidnies only excepted; for, after that the vena cava and aorta descending from the diaphragma have passed the region of the kidnies, the cava hides itself under the aorta, through all that region, till they pass out of the abdomen; and then the artery again hides itself under the cava. The magnitude of the aorta is very great, but the descendant part is greater than the ascendant, because the number of the internal parts is greater than of the external. The number of arteries, is less than of veins, because the passage of the blood is quick through the arteries, but slow through the veins; but there are more arteries than we can well discern, because the capillary arteries are very much like the veins. Their substance is membranous, so that they can be both distended and contracted more than the veins; and it consists of two peculiar tunicles; the exterior is thin, soft, and rare, like the tunicle of a vein; the interior is compact, hard, and very thick, five times thicker than the tunicle of the veins; that thereby the arteries may be strong to endure their perpetual motion, and to keep in their thin and spirituous blood, which would soon vanish and fly away.

The *arteria magna*, or aorta, the great and chiefest artery, comes from the left ventricle of the heart, with a wide orifice; it has a double tunicle, the innermost of which is five times thicker, lest, by continual pulsation about the hard and solid parts, it might incur an incurable rupture. From the ventricle of the heart, before it perforates the *pericardium*, it sends forth to the heart itself the coronary artery which compasses the basis of the heart, sometimes single, sometimes double. Afterwards coming through the *pericardium* or heart-bag, it is divided

into two trunks, the smaller ascending, and the greater descending.

The smaller or ascending trunk of the aorta, or *arteria magna*, resting upon the wind-pipe, provides for all the parts about the heart, and is divided into two subclavial branches, the latter rising lower, and going more obliquely to the arm; the others, before they go out of the thorax, (for afterwards they are called *axillares*.) produce the *intercostoles superiores*, proper to three or four upper ribs; from the upper part arise four arteries: 1. *mammariæ*, which go to the paps; 2. *cervicales*, which go to the muscles of the neck; 3. *arteria musculæ*, which are approximate to the jugular veins; 4. the *carotides*, or sleep-arteries, which are two, unequal, and ascend upwards to the head by the sides of the wind-pipe, being knit to the internal jugulars: when they come to the fauces, before they enter the skull, they give branches to the larynx and tongue, and then they divide themselves into the *carotis externa* and *carotis interna*. The *carotis externa*, being the smaller, furnishes the cheeks and muscles of the face: at the root of the ears it is divided into two branches: the first is sent to the hinder part of the ear, whence arise two other branches, which go to the lower jaw, and the root of all the lower teeth; the second goes to the temples, the forehead, and muscles of the face. The *carotis interna*, at the saddle of the *os sphæmoides*, under the *dura mater*, makes the *reta mirabile*, then passes through the *dura mater*, and sends forth two branches: the first, which is the smaller, goes with the optic nerve to the eyes: the second, which is the greater, ascends to the side of the *glandula pituitaria*, and is distributed through the *pia mater* and the substantive of the brain.

When the subclavian branches have left the breast or thorax they are called axillares, and carry nourishment to the outward part of the breast, and to the whole arm. From the axillares arise the *thora-*

cica superior, or upper breast artery; *thoracica inferior*, or lower breast artery; the *scapularis*, or shoulder-blade artery. From the upper part of the axillares arises the *humeraria*; the remainder goes from the axillary on each side to the arm; where it is carried along through the arm, descending between the muscle, with a vein and nerve of the arm. Under the bending of the elbow, it is divided into two branches, the upper and the lower, which accompany the branches of the *vena cava*, and are called by the same names. The upper goes right forwards through the middle to the wrist, where the pulse is commonly felt: from thence proceeding under the ring-shaped ligament, it bestows branches upon the thumb, fore-finger, and middle-finger. The lower branch runs through the *ulna* to the wrist, and sends twigs to the ring or little finger, and so proceeds to the wrist beneath, where the pulse may also be felt, especially in such as are lean, and have a strong pulse; but the beating of the pulse is much better felt in the upper branch, that being less covered or hid by the tendon.

The descending trunk of the aorta sends out branches from itself unto the thorax, abdomen, and thighs. From the thorax it sends forth two arteries: 1. the *intercostales inferiores*, which runs to the intervals of the eight lower ribs, and the neighbouring muscles; 2. the *phrenica*, which sends to the diaphragma or midriff, and *pericardium* or heart bag. The rest of the trunk pierces through the clift of the *septum*, and sends ramifications through the abdomen; some of which go along with branches of the vena porta; others the branches of the vena cava.

Afterwards the *arteria magna*, or aorta, hastens the beginning of the os sacrum, where it goes above the vena cava, and no longer under, lest, by reason of its continual motion, it should be hurt against some bone; and here it is called the iliac artery. It is divided like the *vena cava* into two iliac trunks,

and each trunk into an inner and less branch, and into an outward and greater, which go to the thigh. These trunks send out on each side six branches: 1. The *sacra*, immediately after the bipartition; 2. *muscula inferior;* 3, *hypogastrica;* 4. *umbilicalis;* which last three come from the inner trunk; 5. *epigastrica;* 6. *pudenda;* which two last come from the exterior trunk.

The rest of the artery (out of the abdomen), being carried to the thigh, changes its name, and there makes the crural arteries; from whence on each side spring branches above and under the ham. Above the ham, from the outward part of the trunk: 1. *muscula cruralis externa*, to the foremost muscles of the thighs, from the inner; 2. *muscula cruralis interna*, which go to the inner muscles of the thigh; and this is mixed at the knee with a little twig of the *hypogastrica.* Under the ham arise, 1. *popliteas*, which goes to the hinder muscle of the thigh: 2. *suralis*, which is divided into, 1st, *tibicus exterior;* 2nd, *posterior altus;* 3rd, *posterior humilis*, for the muscles of the leg: 3. the last of them is sent to the foot and toes, all along accompanied with the veins, from which they borrow their names. To enter into a more minute detail of their sub-divisions would be useless; the arteries being all delineated on the annexed plate with references to their several names as follows:

1. Aorta, cut from its origin, at the left ventricle of the heart. 2. 2. Trunks of the coronal arteries. 3. The three semilunar valves. 4. 4. Subclavian arteries. 5. 5. Carotid arteries. 6. 6. Vertebral arteries. 7. 7. Arteries of the tongue, &c. 8. 8 Temporal arteries. 11. 11. Occipital arteries. 13. 13. Contortions of the carotides. 15. 15. Ophthalmic arteries. 16. 16. Arteries of the cerbellum. 18. 18. Ramifications of the arteries within the scull. 19. 19. Arteries of the larynx. 21. 21. Mammery arteries. 23, 24, 25, 26. Arteries of the arm, 27. Arteries of the hand and fingers.

28. 28. Descending trunks of the aorta. 29. Bronchial artery. 31. 31. Intercostal arteries. 32. Trunk of the cœliac artery. 33, 33, 33. Hepatic arteries. 34. Arteria cystica. 35, 36, 37, 38, 39. Arteries of the stomach, pylorus, and epiplois. 40. 40. Phrenic arteries. 41. Trunk of the splenic artery. 43, 44, 45, 46, 47. Mesenteric arteries. 49. 49. Emulgent arteries. 51. 51. Spermatic arteries. 52. Arteria sacra. 53. 53. Iliac arteries. 54. 54. 58. 58. Ilicai externi. 55. 55. 59. 59. Iliaci interni. 56. 56. Umbilical arteries. 57. 57. Epigastric arteries. 60. 62. Arteries of the penis and pudendum. 61. 61. Arteries of the bladder. 69. 69. 70. 70. Crural arteries. 72. Arteries of the leg. 73. Arteries of the foot.

OF THE NERVES.

A NERVE or sinew is a similar, spermatic, membranous, long, and white, hollow part: a common organ, serving to carry the long animal spirits into all parts of the body for sense and motion. Its efficient cause is the *vis nervifica*, the nerve-making power or faculty: its matter is a cold and clammy part of the seed. The original dispensation is from the *medulla oblongata*, partly as it is within the skull, and partly as it is in the back bone. Their end and use is to carry the animal faculty with the animal spirits from the brain, for the sense and motion of the whole body. And therefore the nerves inserted into the parts give either sense alone, or both sense and motion, there being neither without the help of a nerve; for, a nerve being cut, the sense and motion of the part is lost. But this sense or motion is according to the parts where they are disseminated, because the nerves of themselves are neither sensitive nor motive; if they are inserted into muscles, (the organs of motion) they are termed *nervi motorii*, motive nerves: if into the instrument of sense, *nervi sentientia* then sensitive. Their situation is, for security, deeper than that of an artery: their magnitude is various, according to the nature of

the organ, and dignity of the action. Those of the eyes are large, because of the action; those of the limbs very large and thick, because of their distance and magnitude; those of the sensory parts are in a middle proportion; those of the nearest parts, as in the muscles of the face, are the smallest of all. The number of the nerves are taken from their conjugations or pairs, and are so called from their coupling or being double; for they sprout out on both sides, except the last or lowest, proceeding from the spinal marrow. The form or figure of the nerve is long, round, and smooth, like conduit pipes: solid to appearance, having no such hollowness as the veins and arteries have; but they have cavities or pores, for the carrying off the animal spirits, though not perceptible to the eyes. The substance of all the nerves is composed of many nervous fibres, which grow mutually together by little membranes; and this substance is thought to be threefold: 1. the internal white and marrowish, from the marrow of the brain, but more compact and thickened; 2. an inner coat from the *pia mater;* 3. an outer coat, from the *dura mater;* but these things sense cannot discover. The substance of the nerves is also either harder or softer: the harder are such as either go a great way, or through some hard body, or by a crooked way, or are ordained for motion, which requires strength; and all parts which have voluntary motion have hard nerves; for that which is hard is fitted to act, that which is softer to suffer: the softer nerves are such as are the shortest, and which belongs to the organs of the senses, as the seeing, tasting, hearing, and smelling, which last are the softest of all; and these require soft nerves, as being the objects of suffering. As their use is to carry the animal spirits and faculties into all parts for sense and motion; so, if they be obstructed in their original, or beginning, or totally, they both perish, and an apoplexy is caused: if the obstruction be but in part, then one part is deprived of sense

and motion: if they are cut asunder, the motion of the part into which they are inserted is lost: moreover, the nerves diffuse animal light into the parts, by which they are directed in their operations. Hence it appears how necessary it is for a physician to know the nerves, their original, differences, and distribution, that he may understand to what part of the *spina dorsi* topic medicaments are to be applied, when sense or motion is hurt in the face, neck, arms, hands, muscles of the belly, womb, bladder, anus, yard, thighs, legs or feet. Moreover, the cause of the gout seems chiefly to be the extravasating of the nervous juice; for the nervous juice, being over-heated or rarified by too much heat, cannot be contained in its proper place; but seeking more room flies out of the solid capacity of the nerve (its proper domicile) into the hollow of the nerve, the channel or the animal spirits, thereby interfering with them, causing an extension of the nerve, opposition, and consequently pain. In the annexed plates all the nerves are delineated, agreeable to the following description and arrangement.

The nerves of the brain are nine pair. 1. The olfactory pair, (fig. 2.) *a. a.* which passing through the os cribrosum, are spread over the membrane of the nostrils. 2. The optic pair, *b b*, which by their expansion form the retina of the eye. 3. The motary pair of the eyes, *c c*, each of which is divided, near the orbit, into six parts, or branches: of which, in human subjects, the first branch goes to the elevator palpebræ; the second, to the elevator of the eye; the third, to the depressor; the fourth, to the adducement; the fifth, to the inferior oblique muscle; and the sixth, into the tunics of the eye; but in other animals, they are divided much otherwise. 4. The pathetic pair, *d d*, which are very small, and run to the trochlear muscle of the eye. 5. The gustatory pair, which are very large, and divided within the cranium into three branches, *f f*, immediately under the dura mater:

of these the first branch, called the ophthalmic, runs to various parts of and about the eye, the eye-lids, the muscles of the forehead and nose, and the integuments of the face. The second branch may be called the superior maxillary one, as being finally distributed through all parts of the upper jaw, the lips, nose, palate, uvula, gums, teeth: a branch of it also runs to the ear, and, joining with a branch of the seventh pair, forms the chorda tympani. The third branch may be called the maxillaris inferior, as being distributed over the several parts of the lower jaw, the tongue, and other parts of the mouth; whence the whole pair of nerves has obtained the name of *par gustatorium;* though a great part of them serves to very different purposes, and is carried to parts that have nothing to do with tasting. 6. The abducent pair, *g g*, except a branch for the formation of the intercostal nerve, is wholly carried to the abducent muscle of the eye; whence its name. The intercostal nerve (fig. 1. and 2), *i i i*, *l l*, *m*, &c. is formed either of ramifications of the two preceding nerves or only of those of the sixth pair. It makes its way out of the cranium by the passage of the internal carotid, and descends near the eighth pair through the neck; and thence through the breast and abdomen, even to the pelvis; and, in its way, makes various plexuses and ganglia, and sends branches to almost all the parts contained in the breast and abdomen. 7. The ruditory pair, *h h*, arise with two trunks; the one of which is called the *portio dura*, or hard portion; the other the *portio mollis*, or soft portion. The last enters the foraman of the os petrosum, and thence through various little apertures gets into the labyrinth of the ear, where it is expanded over all its parts, and constitutes the primary organ of hearing. The harder portion, passing the aqueduct of Fallopius, sends back one branch into the cavity of the cranium; it also sends off another branch, which helps to form the *chorda tympani*, and others of the muscles of

the tympanum. The rest of this pair goes to the external ear; the pericranium, the muscles of the os hyoides, the lips, the eye-lids, and the parotids. 8. The par vagum, *k k k*, with the *accessorias* of Willis, pass out near the lateral sinuses of the dura mater; and, descending through the neck and thorax to the abdomen, send out branches by the way to the larynx, the pharyinx, the heart, the lungs, and especially to the stomach. It also sends off from the upper part of the thorax large branches, which are variously implicated in the neck, thorax, and abdomen, with the linguals, the cervicals, and the intercostals. 9. The lingual pair go immediately to the tongue, and are called by some the motory nerves of the tongue; but, by others, with more justice, the gustatory nerves.

We are to observe, says Heister, that the pair of nerves which the generality of writers have called the tenth pair of the head, are, for many unanswerable reasons, to be properly called the first pair of nerves of the neck. Of the nerves which arise from the spinal marrow, there are properly thirty-two pair. Those of the neck are no less than eight pair; and from them are innumerable branches distributed through the muscles of the head, the neck, the scapula, and the humerus, marked A, B, C, D, &c. to O O, the eighth and last pair: from the third, fourth, and fifth pair, are formed the nerves of the diaphragm; and the sixth, seventh, and eighth pair, together with P P, the first pair of the back, from the six robust nerves of the arm and hands. To this division is the accessory spinal nerve of Willis to be referred, which arises about the origin of the third or fourth pair.

The nerves of the back are twelve pair, marked P P, Q Q, R, S, &c. to Z, and $\alpha\,\beta$, &c. which, besides the branch they give to the brachial nerves, run entirely in the same furrow along the course of the ribs, and are dispersed over the plura, the intercostal, pectoral, and abdominal muscles, the breast and other parts of the thorax.

The nerves of the loins are five pair, marked τ, ϕ, ω, Γ, Θ, with their branches υ, χ, ψ, &c. These are in general dispersed over the loins, the peritonæum, and the integuments and muscles of the abdomen: and, besides this their first pair often gives, on each side, a branch of the diaphragm. The second pair, after inoculating with the branches of the first, third, and fourth pair, forms the crural nerves, 6 6, 7 7, 8 8, &c. which are distributed over the anterior part of the thigh: and, in the same manner a branch is formed of the conjunctions of the second, third, and fourth pair, which passeth through the great foramen of the os pubis to the scrotum, the testicles and the adjoining parts. The fourth and fifth pair of the nerves of the loins, joining with the first, second, third, and fourth pair of the os sacrum, compose the nerve called *ischiatico*, which is the largest in the body, being marked 3 3, in fig. 2 it descends along the hinder part of the thigh, and its branchea are distributed over the whole leg, the foot, and toes; being marked 15, 17, 18, &c.

The nerves of the sacrum form five or six pair, though not always determinately and regularly so: they pass through the foramina of this bone, and the superior ones of them, as already observed, compose the ischiatic nerve; and what remains is dispersed, in a multitude of ramifications, over the parts contained in the pelvis, the intestinum rectum, the bladder, the parts of generaton, and the parts adjacent. They are marked in the figure, Λ, Ξ, Π, Σ, &c.

We shall only add, that 1 1, fig. 2, represent the brachial nerves; 2 2, &c. the communications of the vertebral nerves with the intercostals; *l l*, remarkable communications between the phrenic nerves and the intercostals; *l*, *u u*, &c. the accessory nerve of the eighth pair; *x x*, the phrenic nerves; and *z z* the nerves which go to the tastes, uterus, &c.

OF THE MUSCLES.

A MUSCLE, is a similar, spermatic, sanguinous, membranous, fleshy, fibrous part, and the instrument of voluntary or free motion. It is composed of fibres, for the intention of the motion; of flesh, for the substance; of tendons, which perform the action; of arteries, by which it is nourished; of veins, which carry back the superfluous nourishment; of nerves, which give sense, and convey the motive faculty to the brain; of membranes, which encompass and keep the muscles together; of fat, which moistens them and keeps them from being dried by too much motion. The fibres and flesh are only extended according to the straight portion of the fibres; the tendon is in the beginning and end; the arteries and veins run through the substance of the muscle; the nerve, as soon as it is entered into the substance, is dispersed into a great number of twigs, which end in it, and become inconspicuous; the membrane is proper to the muscle only, and springs either from the tendons, or is framed by nature in the first confirmation of the parts; the fat lies in void spaces to prevent a vacuum or emptiness. The action of a muscle is voluntary or free motion. This action or motion is threefold; first, when the muscle is contracted towards its head within itself, thereby relaxing the opposite muscle; secondly, when the motion is tonic, so that being contracted it remains so; these two motions are primary, *per se*, and not accidental; thirdly, when (after contraction) it is relaxed, or restored to its former position, which motion is accidental and proceeds from another: and therefore muscles are always placed one against another as antagonists. The manner of this action or motion varies according to the variety of parts; for, in the throat, it is swallowing; in the arm, bending and stretching forth; in the anus, expulsion and retention, &c. This motion is voluntary or free; for we can hasten or slacken,

make or stop this motion as we please; but there are some singular muscles, as of the inside of the ear, the midriff, the muscles of the chest, and of the eye-lids, whose motion is partly voluntary, partly natural, because they often perform their actions when we have no thought or will thereto. Those muscles which only perform continual or strong motions, which are all such as are appointed for moving the bones, have tendons; but those which move other parts, as the tongue, lips, forehead, face, bladder, anus, &c. seldom have any; for the muscles move themselves only, as those of the anus and bladder; or they move with themselves and the skin also, as in the lips, forehead, and face; or they move a bone, and such, by reason of the strong motion, requires tendons. The diversity of this motion comes from the diversity of the situation: so a straight muscle has a straight motion; a transverse, a transverse motion; an oblique, an oblique motion; and that which compasses a part, has an orbicular motion, as the sphincters. The efficient cause of these actions or motions, is the soul of the creature, inclined thereto by the appetite or will: now the soul uses three instruments to perform the action; first, the brain, to receive the charge; secondly, the nerve, to carry it to the muscle; thirdly, the muscle to perform the action itself. The differences of muscles are various: first from their substance; some are fleshy, as several of the tongue and larynx; some membranous, as the constrictores of the nose; some partly fleshy, partly nervous, as the temporal muscles: secondly, from their quantity: the greatest of all is the first of those which extend over the breast; for it ascends from the end of the os sacrum, to the first vertebra of the thorax: the least of all is the internal muscle of the ear: thirdly, from their situation, fourthly from their figure, or form, or number, as the muscle deltoides; the muscle bicipites; having two heads; also some have two tails; fifthly,

from their beginnings; some proceed from bones, some from cartilages, as those of the larynx; some from tendons, as the lumbricales; sixthly, from the action; some move by sympathy, as the *froterni*, or *congeneres*; or by antipathy, as the *antagonistæ*; some move themselves only, as the sphincters; some move other parts; some have only one motion, as most of the muscles; some have more than one, as the masseter and trapezius; some are *flexores*, some *extensores*, some *rotatores*, some *supinatores*. As to its being a similar part, it is only said to be so according to sense or appearance; and that it is such it appears, forasmuch as it forms not of itself alone the most simple organical part, as a finger or toe, &c. but they take into their composition, with a muscle, several other similar parts, as bones, cartilages, membranes, skin, &c. Moreover, a truly dissimilar or organical part is only found in itself, not in other parts; but a muscle, as it is but a part of all dissimilar parts, so it goes universally or everywhere to the constitution of all organical parts, which even the most simply organical parts do not.

The muscles of the head are either proper, from which comes the primary motion upon the first vertebra, to which it is immediately and closely joined, being bent forward and backward, or turned round; and they are in number eighteen single, or nine pair: or common, which are those, which together with the head move the neck, and these are the muscles of the neck, of which in their proper place. The first pair is called *splenius* or *splenicus* or *triangularis*; it proceeds from the first vertebra of the breast, is spread out on each side upon the vertrbra reaching to the third vertebra of the neck, from whence it is carried to the middle of the occiput: its use is to draw the head directly backwards: but, if only one of the muscles act, the motion is circular to one side. The second pair is called *complexus*, or *trigeminus*; it is a large muscle assisting the other. It has divers

beginnings at the seventh vertebra of the neck, and at the first, third, and fourth, of the breast, and is after a different manner terminated in the *occiput*. The third pair is called *sub-secundo*, and inserted into the hindermost root of the *processus mammilaris;* its use is lightly to bring the head backwards; or backwards to one side, if but one muscle acts. The fourth pair, called *recti majores*, are small, fleshy, and lean, and spring from the edge of the second spondil or vertebra of the neck, ending in the middle of the occiput. The fifth pair, called *recti minores*, lie concealed under the former, proceeding from the back part of the first spondil, or vertebra of the neck, and is inserted in the occiput; its use is the same with the third and fourth pair. The sixth pair is called *obliqui majores;* it lies beneath and springs from the process of the first vertebra, and ends in the occiput, by the outside of the *recti*. The seventh pair, is called *obliqui minores;* it arises from the second vertebra of the neck, is inserted into the transverse process of the first vertebra, and terminates in the occiput: the use of these two oblique pairs is to bring the head about to the sides. The eighth pair, called *mastoides*, is placed in the fore-part; they arise for the most part double, long, and round, in the forepart of the neck, from the upper part of the *sternum* or breast bone, and midst of the *clavicula*, and is obliquely inserted into the mammillary process, which it embraces; its use is to turn the head. The ninth pair, called *fallopiani*, lies under the throat in the forepart of the neck, and near the first pair of the neck; it arises nervous from the ligaments of the vertebra of the neck, and is inserted into the basis of the head, which it turns in like manner as the former.

The muscles of the forehead have their original from the upper parts of the forehead and skull, near the coronal suture, and being spread out upon the bone thereof, they end at the eye-brows, that they might

lift them up, being severed in the midst of the forehead, right above the nose; but knit at the sides to the temporal muscles.

The muscles of the occiput, or hind part of the head, are rather membranes, which draw backwards the skin of the head, in such persons as have the skin moveable.

The two eyelids are moved by four muscles: the first is the *frontalis*, which is straight, belonging to the upper eye-lid, to lift up the brow. The second is the *musculus ciliarii primus*, which composes about each of the eye-lids. The third is the *musculus ciliaris secundus*, which is drawn out under the eyelids, and arising from the circumference of the *orbita*, or socket of the eye; the use of these *ciliares* is to shut the eye-lids. The fourth is *orbicularis major*; it is of a finger's breadth, encompasses the surface of the *orbita* or socket, and being placed under each eye-lid, and reaching as far as the eye-brow, it closely shuts the eye-lids, by lifting up the lower, and drawing down the eye-brow.

The eye hath six muscles, of which four are straight, and two oblique or circular; they are all seated within the cavity of the skull, and accompany the optic nerve. The first muscle is called *attolens* or *superbus*; it is the upper and thicker, and is the lifter up of the eye, being the proud or scornful muscle. The second is called *deprimens* (the depresser) and *musculus humilis*; it is placed opposite to the other, and draws the eyes downwards towards the cheeks. The third is called *adducens*, the drawer to: also *lectorius*, the reading muscle, because it moves the eye inwards towards the nose. The fourth is called *abducens*, the drawer from, because it draws the eye to the outward corner: it is also termed the *indignatorious*, as being the muscle of indignation. All these four muscles have the same original, progress, and end; the beginning of them all is acute, near the hole where the optic nerve enters into the socket of

the eye, from the membrane whereof they arise; their belly is fleshy and round, and their end a very small tendon: by all these four acting together, the eye is kept from stirring. The fifth muscle, called *obliquus major*, or *superior*, arises from a common beginning with the first four, is carried right out to the inner corner of the eye, where it passes out and ascends in a right angle to the upper side of the cornea: this muscle is the smallest of all, and has the longest tendon, by which it wheels the eye about unto the inner corner. The sixth muscle, called *obliquus internusminor et inferior*, is a short, lean, round and oblique muscle, seated between the eyes and tendons of the second and third muscle; it springs from the lower and almost outward part of the orbit of the eye, and ascending by the outward corner to the upper part of the eye, is inserted into the *cornea* by the region of the *iris*. It whirls about the eye obliquely downwards to its external or outward corner.

The mulcles of the external part of the ear are four pair: of the internal part, two pair; but in most people the ears are immoveable, because of the smallness of the muscles and little need of their motion. Of the four first muscles, three are common with other parts; the fourth is proper to itself. The first muscle is called *deprimens*, common to the ear and each lip, and is a part of the first muscle which moves the cheeks and skin of the face, and is called *quodratus*, the square muscle, very thin and broad, and is implanted into the root of the ear, and pulls it down. The second is called *antrorsum ducens*, or the drawer forwards; it is a part of the frontal muscle, which is carried above the temporal muscle, and is inserted into the upper part of the ear. The third muscle is called *retrorsum ducens*, or *abducens ad posteriora*, the drawer back, and arises from a part of the occipital muscle, above the *processus mammillaris*, with a narrow beginning, from whence

growing broader, it is carried downwards transversely and inserted into the hinder part of the ear. The fourth muscle is called *triparitus*, or *attolens*, the lifter up: it arises from the *processus mammillaris*, and being broad, it grows narrow by little and little, till at last it ends in a tendon, and is inserted into the root of the ear. This is the only proper muscle to the ear, and is rather three-fold, because it has three insertions, though all spring from one place. The fifth muscle which belongs to the internal part of the ear, is called *externus*; it is very small, springing from the skin and membrane which cover the passage of the ear; then, becoming fleshy, it passeth by a short tendon to the outward part of the *tympanum*, and is inserted about the centre of it. The sixth muscle which belongs to the internal part of the ear, is called *internus*, it is small, and placed within the *os petrosum*, with a double tendon, one part of which is fixed to the higher process of the *malleolus* or hammer, the other to its neck. It arises from the basis of the wedge-like bone, then becomes somewhat fleshy, afterwards narrower, and ends in a double tendon. Its use is to draw the head of the hammer obliquely inward.

The nose has eight muscles, or four pair, especially in large nosed people, but they are small because the motion of the nose is little. The first pair are called *openers*, or wideners; they are fleshy, arise from the cheek bone near the muscle of the lips and sides of the nose; they are inserted partly into a part of the upper lip, partly into the lower wing, and end in the top of the nose. The second pair are called *erectores* or *aperientes*, openers: they are most triangular, and with a sharp and fleshy beginning, spring from the suture of the forehead by the *foramen lachrymale*, under the tear-glandule, and, cleaving to the bone, are outwardly inserted and carried to the *pinnæ*, wings, or sides of the nose. The third pair are called *constringentes*, or pulling together: they are

little, arise fleshy about the roots of the *pinnæ*, are carried along transversley, and inserted in the corners of the wings: their use is a little to shut the nostrils. The fourth pair are called *deprimentes;* these are exceeding firm and membranous, lie hid under the coat of the nostrils in the inner part: they arise from the extremity of the *os nasi*, and are implanted into the *pinnæ*, or wings; their use is to depress the nose, or pull it downwards.

The muscles common to both cheeks and lips are, 1. *Zigomaticus*, or *quadratus detrahens*: it is a thin muscle like a membrane, interlaced with fleshy fibres. It arises from the *vertebræ* of the neck, in the outward side, and ascending up by the oblique fibres to the face is implanted in the chin, and terminated in the meeting of the two lips; this pair draws the lips backwards. 2. *Buccinator*, the trumpeter, or cheek-driver or mover: this pair lieth under the former in the upper part of it; and makes all that part of the cheek which is blown up when a trumpet is sounded. It arises from the top of the gums near the farthest grinders, and ends in each lip. The muscles proper to the lips, are either proper to each, or common to both. The upper lip has two pair of muscles proper to it; the lower has but one. The first pair is *attolens sursum trahens*, which draws the lip upwards: it springs from the corner between the eyes and the nose, and is inserted into the substance of the upper lip. The second pair, called *deorsum movens*, arises from the upper jaw-bone, just in the cavity of the cheeks, under the socket of the eye, thin, but broad and fleshy. The third pair, called *deorsum trahens*, proper to the lower lip only, arises from the middle of the chin, with a broad beginning, and ascends directly to the middle of the lower lip, which it moves upwards. The muscles common or belonging to both lips are also three pair: First, *oblique sursum trahens*, that which obliqely draws upwards. The second pair common is *obliquæ*

deorsum trahens, or *deprimens*, moving the lips obliquely downwards. The third, common to both lips, is circular, encompassing and constituting the whole mouth, making the proper substance of the lips: by help whereof, the mouth is pursed or drawn together.

The muscles of the lower jaw are in number twelve, viz. six pair, being six on either side. 1. *Temporalis crotaphites*, the temporal muscle, so called from its situation, because it possesses the cavities of the temples: it is the greatest of all the jaw-muscles, being very firm and strong, it runs along under the *os zigoma*, and is by a very strong and nervous tendon, inserted into the sharp process of the jaw-bone. Its use is forcibly to pull up the lower jaw, and to shut the mouth. 2. *Massetur*, the chewing muscle, or first chewer: it is placed in the cheeks, and arises from a double head. It is inserted into the inferior jaw-bone, by a very broad and strong connection. 3. *Alare externum*, the outward wing muscle. It arises from the *os sphænoides* and the external *processus alaris*, with a beginning partly nervous and partly fleshy, and is inserted into the neck of the lower jaw-bone, and in the inner seat of the head. Its use is to move forward and thrust out. 4. *Masseter internus*, the other chewer, is thick and short, and is implanted into the inner and hinder part of the jaw, with a broad and strong tendon. Its use is to assist the temporal muscle. 5. *Musculus latus*, the double bellied muscle, or broad muscle. It is nervous in the middle, and fleshy at the ends, and is inserted into the chin, under the bending of the jaw, fastened to a ligament, lest it should go too far back. Its use is to draw the jaw downwards to open the mouth. 6. *Musculus latus*, the broad or broadest muscle. It arises from the upper part of the sternum, the clavicula, and shoulder-point, and covering the whole neck and face, it cleaves firmly to the inferior jaw, and is fixed in the middle of the chin.

The four last muscles draw the jaw upwards, and are exceeding strong; the last two only draw it downwards, because it would be apt to depress itself.

The muscles of the *os hyoides* or tongue bone, which is the foundation of the tongue, are in number four pair. 1. *Styrnohyoides*: it arises from the inner but upper part of the sternum, and resting upon the wind-pipe, lies concealed in the fore-part under the skin. 2. *Genio-hyoides*, which arises from the inner part of the chin, fleshy, broad, short, and is inserted into the middle or hollow of the *os hyoides*. Third, *Stylocerato hyoides;* it arises from the root of the *processus styloides*, being lean, round, and seated under the chin. 4. *Ceraca hyoides:* it arises at the first, small, lean, and long, from the upper side of the *scapula*, becomes fleshy about the neck, and passing under the levator of the shoulder blade is inserted into the point of the *hyoides*. This pair is long, and has two bellies, being extenuated in the middle like a tendon.

The muscles moving the tongue are in number five pair: 1. *Styloglossum*, arising from the outside of the *appendix styloides*, and ending with transverse fibres, in both sides of the tongue; it moves the tongue inwards, and by reason of the interwoven fibres, they lift the tongue upwards, if they act both together; or upwards only on one side, if only one acts. 2. *Myloglossum*, arising from the side of the lower jaw, at the roots of the grinding teeth, and ending under the basis of the tongue in the ligament: when both act, they move the tongue to the palate and upper teeth; but when one acts, the tongue is moved obliquely upwards. 3. *Genioglossum*, arising inwardly from the middle of the chin, and terminating almost in the middle of the tongue inwardly. Its use is to thrust the tongue out of the mouth, and also to draw it in again, so that it seems to perform contrary actions. 4. *Hypsiloglossum*, arising fleshy out of the upper and middle region of the

os hyoides, runs along according to the length of the tongue; and is terminated into the middle of it: this pair draws the tongue inward. 5. *Ceratoglossum*, which arises from the upper horns of the hyoides, and is obliquely inserted into the sides of the tongue, near the root thereof. It moves the tongue downward toward the inward parts, when both act; but to the right or left side, if only one be contracted.

The muscles of the larynx, or windpipe, are either common or proper; the common are two pair, *sternothyroides* and *hyothyroides*. 1. *Sternothyroides* arises from the inner side of the sternum, runs along by the larynx and is inserted beneath into the sides of the scutiformis, or shield-fastened gristle. This straightens the chink of the larynx, by drawing down the scutiformis. *Hyothyroides*, arises from the lower side of the os hyoides, being broad and fleshy, and touches the scrutiformis, and is inserted into its basis; it widens the chink, by lifting up the scutiformis. These common muscles are implanted into the larynx, but do not arise therefrom. The proper muscles are five pair. 1. *Thyrocrycoides*, arises from the lowest part of the scutiformis, and ends at the annularis, and is inserted into the lateral parts of the thyroides. 2. *Crycothyroides*, rises from the hinder side of the annularis, fleshy; and is inserted into the lower part of the *glottalis*, with a nervous end, opening the larynx, by drawing asunder the two gristles called *arytenoides*. 3. *Crytoarythenoides lateral*, springs above from the side of the annularis, and is implanted at the sides of the glottalis into the joint, and opens the larynx with the same oblique motion of the gristles. 4. *Thyroarytenoides*, or *glottoides;* this helps the former, and, springing from the inner and forepart of the thyroides, is terminated into the lateral part or sides of the glottalis, or arytenoides, which shuts the larynx by a straight passage; if this pair is inflamed in a quinsy, it is mortal, because it exactly shuts the chink. 5. *Arytenoides*, is a round

muscle, compassing the ewer-like cartilage: it arises from the hinder line of the guttalis, and, being carried along with transverse fibres, is inserted into the sides thereof.

The *uvula* has two pair of muscles, two on either side, viz. an external and internal pair. 1. *Ptery-staphylinus externus* rises from the upper jaw, and under the last grinding tooth, ends in a small tendon, which passes through a chink on the upper side of the pterigoides. 2. Ptery-staphylinus internus proceeds from the lower part of the internal wing of the pterygoides, and ascending according to the longitude of the wing is inserted in like manner into the *uvula*.

The *pharynx* or throat, which is the beginning of the *œsophagus*, or gullet, has seven muscles belonging to it, viz. three pair, and one without a fellow. 1. *Sphæropharingæus*, which springs from the sharp point of the *sphœnoides*, and, passing downwards, is inserted into the lateral part of the *pharynx* or throat, to pull up the mouth of the stomach, that it may receive the meat. 2. *Chephalepharyngæus*, which springs from the part where the head is joined to the neck, and running down, is spread about the pharynx or œsophagus, seeming to make the membrane of it. 3. *Stylopharyngæus*, which springs from the styloides process, and is inserted into the sides of the pharynx, both to dilate and amplify it. 4. *Œsophagus*, the muscle without a fellow, being only a sphincture-like muscle, encompassing the gullet. It springs from one side of the thyroides, and circularly encompassing the hinder part of the pharynx, is tied to both the sides of the thyroides, to contract the mouth of the stomach as the sphincter doth the anus.

The muscles of the neck are four pair. The two first pair, to wit, *musculus longus*, and *musculus scalenus*, bend the neck; the two latter pair, viz. *musculus transversalis* and *musculus spinatus* extend it. 1. *Longus*, lies under the *œsophagus or gullet*, springs from the fifth vertebra of the breast, with a

beginning fleshy and sharp, ascends laterally annexed to all the bodies of the vertebræ, terminating in the extuberant process of the vertebræ, with an acute tendon, and sometimes is inserted into the occiput near its great hole. 2. *Scalenus*, it arises fleshy, at the side of the neck, from the first rib, and is inserted inwardly, by oblique fibres, into all the transverse processes of the vertebræ of the neck; through this pair the veins and arteries enter into the arm. 3. *Transversalis*, arising from the transverse eminences or processes of the six uppermost vertebra of the breast, and is inserted into all the external transverse eminences of the neck. 4. *Spinatus*, arising from the roots of the seven uppermost vertebra of the breast, five of the neck, and is inserted into the spine or point of the second vertebra of the neck.

The muscles of the breast or *thorax* are in number sixteen, viz. eight on either side, of which the first five widen or lift up the breast; the last three contract it; to these add, as a ninth, one peculiar muscle, called *diaphragma* or the midriff. 1. *Subclavius*, it arises from the inner part of the *clavicula*, is of the fleshy substance, and is drawn upwards and outwards, and inserted into the upper part of the first rib. 2. *Serratus major*, the greater saw-like muscle; it reaches from the inner basis of the scapula unto six and sometimes seven of the ribs. 3. *Serratus posticus superior*, which grows out of the sharp points or spines of the three lower vertebræ of the neck, and the first of the back, and inserted into the three upper ribs, and sometimes into the fourth. 4. *Musculi intercostales externi*, these are eleven pair in number, but perform the office of one muscle only; are interwoven totally fleshy, and arise from the lower parts of the upper ribs, and descending obliquely towards the back parts, are inserted into the upper parts of the lower ribs, terminating on the cartilages. 5. *Triangularis*, it is small and thin in lean persons, springs out of the inner and lower part of the sternum, and is

inserted into the cartilages of the lower ribs, as far as the third or fourth of the bastard ribs. 6. *Sacralumbus*, which springs from the *os sacrum*, and the spinous processes of the loins, and is inserted into the upper ribs near their roots, bestowing upon each rib a double tendon, one external, the other internal. 7. *Seratus posticas inferior*, it is opposite the superior; and both of them by a broad and membranous tendon, so grow together, that they serve instead of a band to keep the hinder muscle of the backbone together: it grows out of the spines or processes of the three lowest vertebræ of the back, and first of the loins, is terminated into three or four of the lower ribs. 8. *Musculi intercostales interni*, these are the same in number and place with the *externi*, and lie directly under them; they are carried obliquely from the nether rib to the uppermost, and have fibres contrary to those of the external, crosswise intersected. 9. *Diaphragma*, or midriff, called also *precordia*, because it is stretched out before the heart; and *phrenes*, because, being affected, the mind and senses are disturbed, by reason of the consent it has with the brain: so that when the midriff is inflamed, a phrenzy is caused. It is one in number, an instrument of free motion, and an admirable kind of muscle, both in regard of its composition and continual action or motion, serving also as a wall of partition to sever the vital and natural parts one from another. The head of it is in the nervous centre, but the tail in the circumference of the lower short ribs, from whence it arises, and through which it is obliquely drawn about as far as to the vertebra of the loins. It has a double membrane for strength-sake: the upper is from the pleura, to which the pericardium is firmly fastened, and sometimes also the lobes of the lungs; the lower is from the peritonæum.

The muscles of the back and loins are four pair; the first pair is *quadratum*, adhering to the transverse process of the vertebra of the loins, arising in-

wardly from the os ilium and os sacrum, broad and fleshy. Its use is to bend the vertebra of the loins. 2. *Longissimum*, arises with an acute and strong tendon from the extremity of the os sacrum, the vertebra of the loins, and os olii, having the same beginning with the sacrolumbus; to the vertebra of the back it gives tendons like clasps, terminating sometimes in the first vertebra of the breast, and sometimes at the *mamillary processes*. 3. *Sacrum* arises from the os sacrum behind, being fleshy, and terminates in the twelfth vertebra of the breast. 4. *Semispinatum*, which arises where the former ends, and embracing all the spines of the vertebra of the breast, and giving them tendons, it terminates in the spine of the first vertebra of the breast. The uses of these three last are to extend the breast, loins, and their vertebræ: if all the eight muscles act they hold the back straight, and as it were uphold a man.

The muscles of the abdomen or belly cover the lower belly, and have their names partly from their situation and rise, and partly from their figure. They are in number ten, or five pair, whose principal uses are to impel the internal parts, and to move the os sacrum and ilium; or to make a proper retention and compression of the parts in the belly: to provoke voiding the excrements, or help the expulsive faculty of the womb and bladder. Their temperament is hot and moist, to cherish natural heat and concoction; they are moderately thick, to defend the parts, and, when very fleshy, they add much to the comeliness of the body. The first pair is *obliquus descendens*, so called by reason of its fibres, which descend obliquely; it rises in the breast from the lower part of the sixth, seventh, and eighth ribs, and terminate in the white line by a broad tendon. 2. *Obliquus ascendens* is situated next the former, in a triangular figure, rising fleshy from the rib of the os ilii, but membranous from the sharp processes of the vertebræ

of the loins, and from the sharp points of the os sacrum; it ascends obliquely; and terminates in a double tendon embracing the musculus rectus like a sheath; but the duplicity appears only above the navel, for below it is united inseparably. 3. *Musculus rectus;* its original is fleshy from the sternum, on each side the sword-like cartilage, and from the cartilages of the four bastard ribs; it has three nervous insertions which strengthen it; and veins which run along the longitude of it, viz. the *mamamariæ descendentes* from the breasts, and the *epigastricæ ascendentes* from the womb in women, but from the vena cava in men; which meet about the middle of this muscle, extending as far as the region of the navel, and are there terminated. These two veins are joined by *anastomosis,* from whence the consent of the womb with the breast is caused; which, being handled, excites women to venery. 4. *Musculi piramidales,* the pyramidal muscles, lie upon the extremities of the musculi recti, and rise with a fleshy beginning from the external share bone, where all the nerves enter; and, growing narrower by degrees, they terminate with a sharp point in the tendon of the transverse muscle. Their office is to compress the bladder, and therefore they send their tendons, between the musculi recti, into that part of the peritonæum which includes the bladder. 5. *Musculi transversi,* the cross muscles, arising from a certain ligament which springs out of the os sacrum; and terminating by a broad membranous tendon in the linea alba, stick extremely fast to the peritonæum every where except about the pubis. Their proper use is to compress the colon.

The muscles of the *os ilium* and *sacrum* are moved forward in coision by the *musculi recti* and *obliqui descendentes* of the belly, the breast resting and the thigh remaining unmoved. They are moved backwards by the *musculus sacer* and *semispinatus,* which arise from the vertebræ of the back, &c.

The muscles of the penis or yard are two pair; the first pair is called *erector* or *director;* the latter, *accelerator*. 1. *Erector*, or *penem erigens*, is a short and thick pair, arising nervous under the beginning of the yard, from the innermost bunching out of the *ischium*, and being knit unto the ligament of the yard, growing fleshy it reaches sideways as far as the middle of the body thereof; their uses are to erect and keep up the yard in coition. 2. *Musculi acceleratores*, or *par urethrum dilatans*, are longer than the former, but thinner or leaner: they arise both from the sphincter of the anus and internal tuberosity of the ischium or huckle bone, are spread out under the urethra, carried beneath, and inserted into the sides thereof, about its middle: their use is to dilate or widen the urethra, both for the passage of the urine and for the seed in coition. These are the muscles where an apertion is commonly made in cutting for the stone.

The muscles of the *clitoris*, proper to female subjects, are like those in a man's yard, the same in number, and to the same intent. The two uppermost, being round, rise from the internal knob of the ischium, and, being placed by the lateral ligaments, cause the erection of it. The two lower are broad and smooth, and proceed from the sphincter of the anus.

The muscles of the testicles are either proper or common. The proper muscles are only the pair called *cremaster*, arising from a strong ligament in the os pubis, where the transverse muscles of the belly end, of which they seem to be parts; they pass through the production of the peritonæum, which they compass nearly about, and pass with the spermatic vessels to the stones; they are shorter in women than in men, and are placed above the production of the peritonæum: their use is to sustain or hold up the stones. The common muscle is the membrane of the scrotum called *dartos*, being a continu-

ation of the fleshy membrane; and this muscuius membrane suspends both testicles.

The bladder has but one muscle, called *sphincter*, which encompasses the neck of the bladder, in an orbicular form, as also do the fibres. It is fleshy, drawn back over the *prostatæ* or auxiliary testicles; it ejaculates the seed in coition. In women it reaches to the hole by which the urine passes, and it seems to form it.

The muscles of the *anus*, or fundament, are either the *sphincter* or the *levatores;* the *sphincter* muscle, called *ani constrictor*, the shutter or contractor, is fleshy, (and without the straight gut two inches broad;) arises from the lower vertebra of the os sacrum; and is encompassed with the transverse fibres all along the anus: it is fastened on the forepart to the passage of the bladder by fibrous couplings; to the yard, to whose muscles it gives beginning; and to the neck of the womb: on the hinder part it is inserted into the *coccyx* or crupper bone, and at the sides it is fastened into the *os coxæ*. The *musculi levatores* are four, or two pair; one pair of which are broad, and one narrow. *Musculi levatores lati*, arise from the os sacrum and os ilium, and are inserted into the larger sphincter. *Musculi levatores tenues*, the narrow muscles: of which the foremost arises from the transverse ligament; the hindermost from the *coccyx*, whereunto they are terminated.

The muscles of the shoulder-blade, or *scapula*, are four, according to the number of its motions, viz. forward and backward, upward and downward: 1. *Serratus minor*, the smaller saw-like muscle, arising from the four upper ribs, and ascending obliquely upwards, with an end partly fleshy, partly tendinous, and is inserted into the scapula; its use is to draw forwards into the breast. 2. *Trabezius caculares*, arises fleshy from the hinder part of the head towards the ear, from whence it descends to the eighth vertebra of the breast, and, from thence growing

small by degrees, it is inserted into the back-bone, top of the shoulder, and clavicula; it moves the scapula variously, according to its oblique fibres. 3. *Rhomboides*, or diamond-like muscle, situate under the *cucularis*, thin and broad, arises from the three lower vertebra of the neck, and the three upper vertebra of the breast, and in the same breadth is inserted into the external basis of the scapula; it draws back a little obliquely upwards. 4. *Levator musculus patientiæ*, arise from the transverse apophysis of the second, third, and fourth, vetebræ of the neck, and is inserted into the higher and lower corners of the scapula; its use is to lift the shoulder up.

The arm is variously moved, therefore has it many muscles, to wit, nine in number. 1. *Pectoralis* is great and fleshy, arising from the whole breast-bone, and the gristle thereof, the sternum, and above half the clavicula, and is by a sharp tendon inserted into the shoulder-bone, between the deltoides and the biceps. 2. *Deltoides*, from the likeness to the letter Λ, springs from the middle of the clavicula, and the acromium, and is inserted into the middle of the arm or shoulder bone. 3. *Latissimus*, springs from the vertebræ of the loins, and of nine vertebræ of the back, and is inserted into a part of the arm, between the pectoral and round muscle, with a strong, short, and broad, tendon: this with its fellow of the other arm covers almost the whole back: it is called *ani scalptor*, because it draws the arm backwards and downwards. 4. *Rotundus major* is fleshy, thicker, and rounder than the rest, obliquely seated behind under the axilla, and arises from the lower rib of the scapula, which, ascending a little with its tendon, short, broad, and strong, is inserted (with the pectoral muscle) into the middle of the arm. 5. *Rotundus minor* is short, round, quite fleshy, and arises with a sharp beginning out of the lower corner of the scapula, terminating with an acute end in that ligament,

with which the head of the shoulder is involved. 6. *Infra-spinatus,* arises in the middle between the smaller round muscle and the spina, covers the whole external bunching part of the scapula; then becoming more narrow, it is inserted into the neck of the arm, or shoulder. 7. *Supra-spinatus* is fleshy, and arises out of the spine of the upper rib of the scapula, then being conveyed under the acronium, 't is inserted with a broad and strong tendon into the neck of the arm, at the ligament of the joint. 8. *Subscapularis,* or *immersus,* is very fleshy, and passes between the scapula and ribs, possessing the hollow and inward part of the shoulder-blade, then is carried out, and inserted with a broad tendon, internally into the second ligament of the humerus. 9. *Coracoides* is inserted into the inner part of the shoulder, about the middle of the arm, by the tendon of the deltoides. Its beginning is nervous and short: and its belly has an hole in it (whence its name) to give a passage to the nerves running to the muscles of the cubit.

The *cubit* or elbow has two bones, the *ulna* and *radius:* the *ulna* serves for flexion and extension; but the *radius* for pronation and supination. The *ulna* is bended by two muscles, the *biceps* and *brachieus internus,* and extended by four, viz. *longus, brevis, cubitalis,* and *brachieus externus.* 1. *Biceps* arises from the scapula, round and tendinous, which is inserted into the inner part of the radius. 2. *Brachieus internus* is placed beneath the biceps, smaller than the former, and arising from the middle of the os brachii, and is inserted before into the common beginning of the radius and ulna. 3. *Longus,* or *extendens primus,* arises from the lower rib of the shoulder-blade, near the neck, with a double beginning, and is terminated in the elbow. 4. *Brevis extendens secundus,* springs from the hinder neck of the arm, mixed with the foregoing muscle, clothes the humeri, and terminates on the outside of the

elbow. 5. *Anconeus extendens tertius* is situate in the bending of the cubit, on the hinder side; it arises out of the lower and hinder part of the arm, between the ulna and radius, and is inserted by a nervous tendon into the side of the cubit. 6. *Brachieus externus*, being spread out upon the outside of the brachium: it is a fleshy lump, made of the two former, and is placed under them, being inserted into the same place.

The radius has four muscles, two of which are *pronatores*, or pullers down; and two *supinatores*, or pullers up. 1. *Pronator superior* arises from the inner apophysis of the arm, by a strong and fleshy beginning, and ends with a membranous tendon, obliquely running into the middle of the radius. 2. *Pronator inferior*, from the lower part of the cubit ulna, unto the lower part of the radius, and is there inserted. 3. *Supinator longior*, from the top of the brachium, above the external knob, and, being drawn out upon the radius, is inserted on the inside of the lower epiphysis thereof. 4. *Supinator brevior*, springs from the outward apophysis of the arm, fleshy within, membranous without, and is inserted nearly into the middle of the radius.

To the wrist belong four muscles, of which the first two bend it, and the latter two extend it. 1. *Cubiteus internus*, the first bender, arises from the internal apophysis of the arm, and being stretched over the elbow, is inserted with a thick tendon into the fourth bone of the wrist. 2. *Radieus internus*, the second bender, is drawn along the radius, arises from the beginning with the former, and terminates in the first bone of the metacarpium, under the forefinger. 3. *Radieus externus*, arises with a broad beginning, from the external apophysis of the arm, and terminates in a double tendon at the first and second bones of the os metacarpi. 4. *Cubiteus externus* arises from the same beginning, through the length of the cubit; when it comes to the wrist, it

becomes a strong round tendon, and is inserted into the upper part of the fourth bone of the metacordus, under the little finger.

In the palm or hollow of the hand are two muscles, called *palmares*, of which the one is long, the other short. 1. *Palmaris longus*, arises from the inward apophysis of the arm, with a round and tendinous beginning, is spread into the hollow of the hand, cleaving exceeding fast to the skin, where, under the skin, in the hollow of the palm, is a broad tendon, giving exquisite sense to that part; it is terminated into the first intervals between the joints of the fingers. 2. *Palmaris brevis*, is a certain four-square fleshy substance, springing from the membrana carnosa, from whence it is carried under the former muscle, to the middle of the palm of the hand, and is inserted into the outside of that tendon, which bears the little finger from the rest.

The thumb is bent by two muscles, extended by two, and drawn side-ways by six. *Flexor primus*, arising from the upper part of the radius, is inserted into one of the joints. 2. *Flexor secundus*, arising from the wrist-bone, is inserted into the middle of the thumb, and lies wholly under the former. 3. *Extensor primus*. arising out of the upper and outward side of the cubit, runs along the radius, is carried beyond the wrist, and is inserted into the first and second joint of the thumb, by a double and sometimes a triple tendon. 4. *Extensor alter*, arises from the same part of the cubit, but lower near the wrist, and is inserted into the third joint of the thumb. 5. *Adducens primus*, is joined unto and seated beneath the thenar, arising out of the three lower bones of the metacarpium, and is inserted into the second joint of the thumb; this draws the thumb to the fore-finger. 6. *Adducens secundus*, the second drawer of the thumb to the fore-finger; it arises out of the metacarpium, and is inserted as the other. 7. *Adducens tertius*, drawing also the thumb to the fore-finger,

arises out of the external side of the metacarpium, which sustains the thumb, and is inserted into the first joint. 8. *Adducens primus*, or *thenar*, the first drawer away, arises from the inside of the wrist, and is inserted into the second joint of the thumb, to draw it from the fingers. 9. 10. *Adducens secundus* and *tertius*, arise and are inserted as the former, to draw the thumb also from the fore-finger.

The fingers are bent, extended, and moved laterally, for the performance of which are seventeen muscles; they are as follows: *Sublimis*, or *perforatus*, it arises from the inner apo physis of the arm, it is divided into four tendons inclosed in a ligament, as it were in a ring, which are inserted into the second jointing of the fingers, a cleft being first made, through which the tendons of the following muscles pass. *Profundus*, or *perforans*, is spread out under the former, and is inserted through the clifts of the former tendons into the third jointings of the fingers; it arises from the upper parts of the ulna or radius under the joint, and is divided into four tendons. *Hypothenar digitaminimi*, *proprius auricularis*, the muscle proper to the little finger; it arises in the hollow of the hand, from the third and fourth wrist-bones of the second rank, and is inserted externally into the side of the first joint of the said finger. *Extensor magnus*, arises from the exterior *apophysis* of the arm, about the wrist, and the ring-fashioned ligament; is divided into four tendons, which end in the lowermost joints of the fingers. *Indicator indicis extensor;* it arises from the middle and external cubit or *ulna*, and is terminated with a double tendon into the second interjointure of the fore-finger. *Auricularis*, the extensor of the little finger; it arises from the upper part of the radius, and, being carried along with the *ulna* and *radius*, is externally inserted into the little finger with a double tendon. *Lumbricales*, *adducens primus*, *secundus*, *tertius*, *quartus*, the four worm-like muscles; they arise

from the tendons of the musculus profundus by the wrist; and, being drawn out along the sides of the fingers, are obliquely carried and inserted into the third joint of every finger. *Abductores interossei externi* and *interni*, the drawers from the thumb; they arise from the upper parts of the bones of the metacarpium near the wrist, and in the first internodum or space between the joints, with a very small tendon, which, joining with the vermiculares, run along the sides of the fingers, over the three bones, till they come to the roots of the nails; in the former and upper part whereof, the tendons, being first united, are terminated. *Abductor indicis;* it arises from the first interjointing of the thumb, and is inserted into the bones of the fore-finger, by which it is drawn from the rest of the fingers towards the thumb.

The thighs are capable of being bent, extended, drawn to or wheeled inward, or turned about outwards; for the performance of which they have the following sixteen muscles. 1. *Psoas primus lumbarus*, the first loin muscle; it arises from the vertebræ of the loins, and is inserted into the fore part of the small trochanter, with a round and strong tendon. 2. *Psoas minor*, it is sometimes spread over, sometimes under, the former; its beginning is fleshy, sometimes one, two, or three fingers broad in its middle; its original, with a small flat tendon, being carried over or under the psoas, comes to the iliac, and with a very broad and strong tendon is inserted into the upper brim of the os ilii. 3. *Iliacus musculus*, rises out of the internal cavity of the os ilium, is joined by its tendon with the lumbal muscle, and is terminated between the great and little trochanter. 4. *Musculus pectineus*, the comb muscle, springs out of the upper part of the os pubis, and is inserted with a short tendon into the inner side of the thigh. 5. *Triceps primus*, arises from the upper jointing of the os pubis, and passing by the inner head of the

thigh-bone, is inserted into the middle of the thigh. 6. *Triceps secundus*, arises from the lowest jointing of the os pubis, and, passing by the inner head of the thigh, runs along to the end of the thigh. 7. *Triceps tertius*, arises from the middle of the os pubis, and is inserted just below the neck of the thigh-bone. These three muscles may reckon but one, and call it *triceus*, from its three-fold beginning: but, so accounted, it is the greatest of all the muscles of the body, and often ends in one musculus tendon, inserted into the hinder part of the bone. 8. *Gluteus major*, arises from the coccyx or crupper (the spine of the ilii and os sacrum), and is inserted into the os femeris, under the great trochanter. 9. *Gluteus medius*, the middlemost both in situation and magnitude, arises from the inner side of the spine of the os ilii, and is inserted into the great trochanter with a broad and strong tendon. 10. *Gluteus minimus internus*, springs from the back of the os ilii, near the acetabulum, with a broad and strong tendon, and is inserted into the great trochanter: these last three make up the fleshy substance of the buttocks. 11. *Quadrigeminus primus*, it arises from the lower part of the os sacrum, and is placed upon the articulation of the thigh, in the hinder part thereof. 12. *Quadrigeminus secundus*, arises from the tuberosity of the huckle-bone, and covers the articulation of the thigh, as aforesaid. 13. *Quadrigeminus tertius*, is contiguous to the former, and arises from the same part; these three are last inserted into the cavity of the great trochanter. 14. *Quadrigeminus quartus*, is broader and more fleshy than the other three, being distant from the third of the quadrigemini two fingers' breadth; it springs from the inner side of the apophysis of the ischium, or huckle-bone, and is inserted into the external part of the great trochanter. 15. *Obturatur externus* takes up the wide hole between the os pubis and os ischii, and arises from the outward circle of the os

pubis, is circumducted through the neck of the thigh, and is carried into the cavity of the great trochanter, under the fourth quadrigeminal muscle. 16. *Obturatur internus* rises from the inward circle of the os pubis, and by a trepartite tendon is inserted into the cavity of the great trochanter.

To the legs belong eleven muscles, viz. 1. *Biceps*, having two heads; the first springs from the joining of the os pubis, the second from the outward part of the thigh; both of them are inserted with one tendon into the hinder or inward part of the leg. 2. *Semimembranosus*, arises from the swelling in the ischium, and is inserted into the inner side of the leg backwards. 3. *Seminervosus*, has the same original and insertion with the former, only in the hinder part is carried a little forwards obliquely, before it terminates at the inside of the leg. 4. *Gracilis* and *gracilis posticus*, rises from that line where the hip-bone and share-bones join together, and, descending along the inside of the thigh, is inserted into the inner part of the leg. 5. *Rectus gracilis* springs with an acute tendon out of the outward and lower spine of the os ilium, is carried along the thigh, and terminates in the fore part of the leg. 6. *Vastus externus* borders upon the rectus gracilis, and arises out of the great trochanter, and is inserted into the leg, a little below the patella on the outside. 7. *Vastus internus*, borders as the former on the rectus gracilis, and arises out of the root of the small trochanter, and falls into the inner side of the leg a little below the patella. 8. *Crureus*, arises out of the thigh-bone between the two trochanters, and, cleaving to the thigh, produces its tendon over the epigonatis, unto the fore-part of the leg; the four last muscles are inserted all into one tendon, which terminate in the beginning of the leg. 9. *Musculus longus*, it is nearly the longest of all the muscles; arises from the former spine of the os ilii, and descends oblique into the inner and fore-part of the leg.

10. *Poplitæus;* it arises from the lower and exterior tubercle of the thigh, and is inserted four-square into the inner and upper part of the leg, obliquely. 11. *Membranosus fascia lata,* rises from the spine of the os ilii, runs obliquely into the outward part of the leg, and, with a broad and long tendon, invests almost all the muscles of the thigh.

The foot, or instep, has eight muscles. 1. *Tibiæus anticus,* it is fastened to the leg, and arises near the fibula, and, cleaving to the tibia all along, it degenerates into a tendon, which beneath the ring-like ligament of the foot is divided into two tendons. 2. *Peroneus anticus,* joined to the peroneus posticus, and has its rise with two heads, one from the middle and external part of the perone or smaller focile; the other from the upper epiphysis of the fibula; these, being carried through the chink of the ancle, terminate in a double tendon, the smaller of which is carried into the bone of the little toe; the greater running obliquely under the sole of the foot. 3. *Gemellus externus:* this has two heads; they both arise from under the ham, the one from the inner, the other from the outward parts of the end of the thigh-bone, and pass down the back part of the leg, then become tendinous, and, being united, make one strong, broad, and nervous, tendon, which is inserted into the heel. 4. *Gemellus internus;* this with the other constitutes the ancle, and lies under the former, of a livid colour; it arises under the ham, by a strong nervous substance; having passed the middle of the tibia, it becomes narrower and tendinous: it is inserted into the heel. These make the belly or calf of the leg. 5. *Soleus,* it is a broad and thick muscle arising from the upper and hindermore appendix of the fibula, and is inserted by a tendon into the heel. 6. *Tibiæus posticus adducens pedem,* it arises from the upper part of the tibia, or greater and smaller focile, and from the ligament which ties them together, runs along the tibia and through the cleft of the ancle-bone, where it pro-

duces two tendons. 7. *Peroneus posticus*, it arises from the upper but hinder part of the small focile, by a nervous and strong beginning, and, cleaving to the outside of the perone, it runs down round and fleshy: it is inserted under the sole of the foot, into the bone set before the great toe. 8. *Plantaris* covers the whole sole of the foot; and springing from the outer part of the thigh-bone under the ham, by a round and fleshy beginning, passing within the leg, between the gemelli, it goes thence to the sole, and is inserted into the five toes.

The great toe has five muscles. 1. *Primus*, or *flexor pollicis*, arises from the upper part of the fibula, and is inserted into the third joint, of the great toe. 2. *Secundus*, or *extensor pollicis*, arises from the middle of the fibula, or from the outside of the tibia, where it is separate from the fibula, creeps along the surface of the foot, and ends in two tendons, the one of which is inserted into the upper side, the other into the lower side, of the great toe. 3. *Tertius pollicis, adductor primus*, that which draws the toe inward, and springs from the ligament which ties the heel-bone and the taulis, is fastened inwardly to the bone set before the great toe, and by a round tendon is inserted into the first joint of the same. 4. *Quartus pollicis, adductor secundus*, it arises from the ligament of the first interjuncture of the little toe, then, becoming fleshy, runs over the first joint of the toes, and with a short and broad tendon is inserted a little inwards into the first joint of the great toe. 5. *Quintus pollicis, abductor ejusdem*, it arises fleshy, from the inner part of the heel, and is inserted extrinsically into the first bone of the great toe.

The muscles of the four little toes are eighteen, having tendons comprehended with a circular and transverse ligament, which encompasses them beneath the ancles, just as in the wrist. *Musculus major*, arising from the upper apophysis of the tibia, under the ham, by a long and fleshy beginning, passes under

the inner ancle, and by the hollowness of the heel goes to the sole of the foot, where it is divided into four tendons, inserted into the third and last joint of the four toes. *Flexor minor*, lies in the midst of the sole of the foot, arising from the inner part of the heel-bone, and is divided into four round tendons, which are carried and inserted into the second articulation of the four toes. *Extensor longus*, arises with a nervous and short beginning from the upper appendix of the tibia, and cleaving to the ligament which unites the focils, runs down to the foot, passing first under the transverse ligament; then, being divided into four tendons, they are inserted into the second and third joints of the four toes. *Extensor brevis*, lies under the former, arises from the transverse ligament, fleshy and broad, and is by four tendons inserted into the first joints of the four toes. *Lumbricales quatuor*, they arise from the tendons of the perforans, small and round, and are inserted by so many small tendons into the sides of the first joints of the four toes. *Interossei decem*, they arise from the bones of the pedium, and are placed between the bones of the foot, filling the void spaces of the metapedium, being ten in number, five external and five internal. They arise by the sides of the bones of the instep, the former to the first interjointings; the ninth of the interossei is the abductor of the great toe, the tenth and last is the special abductor of the little toe.

As to the number of muscles in the human body, authors are strangely disagreed about it: however they are certainly more than five hundred; the principal whereof are represented in the two annexed plates; those conspicuous in the fore-part of the human body being expressed in Plate 1. where 1. 1. are the frontal muscles; 2. 2. the obiculares palbebrarum; 3. the ottollens auriculam; 4. the temporalis; 5. the masseter; 6. represents the muscle called constrictor, or depressor pinnæ narium; 7. the dilatator alæ nasi; 8. the zigomaticus; 9. the place of the elevator labio-

rum communis, called by Lancisi, gracilis; 10. the elevator labii superioris proprius; 11. 11. the constrictor, or sphincter labiorum, or orbicularis labiorum; by some called osculatorius; 12. the buccinator; 13. 13. the musculi mastoidei; 14. 14. the sternohyoidei; 15. 15. those parts of the muscles which arise from the clavicle; 16. 16. the caracohyoidei; 17. the scaleni; 18. represents part of the cucullaris on the right side; 18. on the left side is the levator, or elevator scapulæ, otherwise called musculous patientiæ; 19. 19. the place where the fibres of the pectoralis unite in some measure with those of the deltoides; 20. 20. the deltoides; 21. the place in the carpus where the palmaris longus passes through a ring in the annular ligament; 22. a remarkable union of the tendons of the extensors of the three last fingers; 23. 23. the productions of the peritonæum, which perforating the muscles of the abdomen at the rings, descend to the scrotum; 24. 24. the place where the three tendons of the sartorius, gracilis, and seminervosus, are inserted into the interior part of the tibia, just under the knee; 25. 25. the tendons of the extensors of the toes, which are secured by a ligament at the ancle, as appears on both sides; but on the right side, internally, another ligament is represented, which fixes the tendons of the extensor longus digitorum, the tibiæus, posticus, and the flexor pollicis; 26. 26. the musculus pectoralis; 27. the triceps extensor cubiti on the right side; 28. and 30. the biceps on the left side, according to Lancisi's explication; 29. part of the triceps extensor on the left side; 30. the biceps on the right side; 31. the branchiæus internus; 32. the anconæus; 33. the prenator rotundus; 34. 34. the supinator longus; 35. 35. the radius externus, according to Lancisi; 36. the extensor carpi ulnaris; 37. 37. the cubitæus internus, according to Lancisi: 38. the radius internus, according to Lancisi; 39. the palmaris with its tendinous expansion; 40. 40. the tendons of the muscles of the thumb; 41. the tendon of the adductor pollicis;

42. the extensor magnus digitorum; 43. ligamentum carpi; 44. 44. the tendons of the iliaci interni; 45. the pectinæus; 46. one of the heads of the triceps; 47. 47. the rectus femoris on each side; 48. 48. the vastus externus on each side; 49. 49. the vastus internus on each side; 50. the gracilis; 51. the seminervosus; 52. the sartorius on each side; 53. a part of the origin of the vastus externus; 54. 54. the membranosus; 55. the tibialis anticus; 56. the gemelli; 57. 57. the solæi; 58. the tendon Achilles; 59. according to Lancisi, is the extensor digitorum longus; 60. the tendons of the extensors of the toes; 61. the tendons of the extensor longus, tibiæus posticus, and flexor pollicis: A. A. portions of the latissimus dorsi on each side; B. B. the indentations of the serratus major anticus; C. C. the sternum.

The second plate represents the muscles of the back part of the human body; where 1. 1. expresses the two muscles upon the occiput, called by Eustachius, quadrati; 2. the musculus cucullaris; 3. the splenius; 4. the musculus mastoideus; 5. the musculus patientiæ, or levator scapulæ proprius; 6. the rhomboides; 7. the articulation of the clavicle with the scapula on the right side; 8. the deltoides; 9. the teres minor; 10. the teres major; 11. 11. the latissimus dorsi on each side; 12. the glutæus major; 13. the glutæus medius; 14. the musculus pyriformis; 15. the quadratus femoris; 16. the biceps femoris; 17. the semimembranosus; 18. the membranosus, according to Lancisi; 19. 19. the vasi externi; 20. the gastrocnemii; 21. the soleus; 22. the plantaris.

OF THE BONES, OR HUMAN SKELETON.

A BONE is a similar, spermatic part, cold and dry, endowed with hardness, strength, and solidity, that it might give force to the body, sustain it, and help its motion. Its substance is naturally hard and solid, covered with a membrane, called *periostion*, white, with some redness; hollow in the middle, (ex-

cept the ribs, &c.) smooth: covered in its extremities with a cartilage, and moistened with a fat humour, called *medulla*, or marrow. Some bones are perfectly generated in the womb, as those in the ear, being the smallest in the whole body; they are nourished by arterial blood, as may appear in the bones of young animals, whose marrow is yet bloody, as also by blood contained in the marrow: but the proximate and immediate nutriment of hollow bones, is the marrow; but of bones not hollowed, thick blood sent in through the pores. The proper matter therefore of a bone is seed, which consists of humours and spirits. The efficient cause is the *vis ossifica*, or an innate faculty acting by the assistance of heat.

The bones are joined together, either by *symphysis* for firmness and union; or by *arthrosis*, articulations or jointing. Natural union or growing together, is when the connection or joining of bones is without motion: and this is with or without a medium. *Symphysis* without a medium is threefold, viz. by *sutura*, *harmonia*, and *gomphosis*. *Sutura*, a suture, is the joining of bones by indenture, as if the teeth of two saws were thrust one into another, as in the bones of the *cranium* or skull. *Harmonia* is the joining of bones by a single line, whether strait, oblique, or circular, as in the bones of the nose and upper jaw, and so all *epiphyses* in a manner are joined. *Gomphosis* or nailing, when one bone is fastened into another, as a nail in a post, so the teeth are fastened in the jaw-bones.

The whole structure of the bones of the head is called *cranium*, the skull, because it is as it were an helmet, it is also called *calva* and *calvaria*: its substance is bony, to secure the brain; but in new-born children, it is softer than ordinary.

The bones of the head are either proper or common: the proper are in number six: 1. *os frontis*; 2, 3, *ossa sincipitis*; 4. *occipitis*: 5, 6. *ossa temporum*. The common bones are only two in number: *os sphæ-*

noides, and *os ethmoides*. *Os frontis*, the forehead-bone, called also *coronale*, is bounded before by the coronal and first common suture, and in the sides by the temporal bones; it is but one in those of ripe age, but in children it is double, being divided by a suture passing from the coronal to the nose; it also has a two-fold table, an internal and an external: on each side of this bone, above the eye-brows, there are large cavities, commonly two in number, between the two tables, clothed sometimes with a green membrane, and containing a soft, clammy, and marrowish, substance; from whence two holes pass into the wide spaces of the nostrils: and another, which ends into the skull above the *septum* of the *os ethmoides*, to distinguish the organ of smelling.

Ossa sincipitis, the bones of the fore-part of the head: these cover the moistest part of the brain, are in shape four-square and unequal, and of a more rare or spungy substance than the other bones, whence the wounds of the *sinciput* are deadly; they are joined before with the bones of the forehead, with the *coronal suture*; to the *os occipitis*, by the *lambdoide suture*; and to the *ossa temporum*, by the *suturæ squamosæ*; without they are smooth, but within unequal, by reason of the prints which the jugular vein of the *dura mater* leave behind them.

Os occipitis, the bone of the hinder part of the head, constitutes almost all the hinder part of the skull; and is in children three or four bones, but in grown persons but one. Its form is that of a spherical triangle, and is joined to the crown-bones by the *suture lambdoides*. It is the thickest and most compact of all the bones of the head, chiefly at the basis of the skull; (because there the noble ventricle is seated, and from thence the nerves arise as from a fountain;) but at the edges it is the thinnest of all. It is smooth without, but within it has many sinuosities to receive mennings safely. It has five holes, through the greatest whereof the *spinalis medulla*

passes to the back-bone. The smaller serve or the going forth of the nerves, and entrance of the veins and arteries. It has nine cavities, seven within and two without; and two broad processes at the basis, covered with a gristle, which is more eminent, and inserted into the cavities of the first *vertebra* for the motion of the head; as also another small process behind joined to the first *vertebra*.

Ossa temporum, the bones of the temple. Their form is uneven, almost circular, because of their various substance, which is like rocks and craggy cliffs, for which cause they are also called *ossa petrosa*, the ssony or rocky bones. In their upper part they are attenuated like a scale, so as to be transparent, and are joined to the bones of the *sinciput* like scales; before they are joined to the first bone of the upper jaw, by its first process; and to the *os occipitis*, by the bastard suture; they have six holes without, two within: the first external hole is large, viz. the auditory passage; the other five are small for vessels to pass through. They have two cavities, an outer covered with a gristle, which receives the lower jaw-bone; and an inner, which is rather long, and common to the *os occipitis*. The *auricularis* is internal with a long protuberancy, wherein there is a three-fold cavity, viz. the drum, the *labyrinth*, and the *cochlea*. The *tympanum* or *drum*, called also *pelvis*, which contains the internal or inbred air, and the four bones, called *melleolus*, *incus*, *stapes*, and *orbiculare*; as also a ligament, two *fenestræ*, or windows, (which are little holes in the cavity,) and a water passage; from this cavity goes a channel into the palate of the mouth. The *labyrinthus*, called also *fodina*, is a cavity full of crooked and manifold turnings: the entrance hereinto is the *oval fenestræ*, and joins itself to the following cavity; it has four holes besides the oval, and a fifth which is terminated in the *cochlea* or third cavity. The *cochlea* has three or four windings, (with a wreathed or snail-like figure)

the windings mutually receiving one another; those that are thick of hearing have only one or two of those windings; this cavity is clothed with an exceeding thin and soft membrane, and adorned with multitudes of little veins, which turn themselves about the wreathings of the *cochlea*, and by many branches creep into the secret turnings of the *labyrinth*.

Os sphenoides, or the wedge fashioned bone, because it is seated as a wedge in the middle of the bones of the skull; at the sides it goes along with the *os petrosum*, from whence it is separated by a rough chink; above it touches the first, fourth, and sixth bones of the upper jaw; below it touches the bones of the palate of the mouth, and is placed under the brain, as a foundation, so that it touches almost all the bones of the head and upper jaw: in children it is made of four bones, but in grown persons it is but one. It is solid, and the thickest of all the bones of the head, where it makes the basis of the skull. In the external table are two remarkable *apophyses*, near the sides of the holes of the nose, formed like the wings of a bat. In the internal table are four little processes, in the shape of a Turkish saddle, called *sella Turcica*, full of little holes, whose uses are to elaborate the inbreathed air, to make spirits, and to pass out pituitous excrements through the funnel, out of the ventricles of the brain. It has sundry perforations, by which the optic and motory nerves of the eye, and other nerves for the motion of other parts, as also veins and arteries for nourishment, pass.

Os ethmoides, the sponge or sieve-fashioned bone, having in it many holes, (by which smells pass to the brain,) especially in the inner side of it, where it joins the head, and this part is properly called *cribrosa:* from this within the skull arises a sharp apophysis, resembling a cock's-comb, by which the *ethmoides* is divided into two parts; from this pro-

cess is opposed another, without the nostrils, and distinguishing them, called the divider of the nostrils, as also *septum nasi.* The chief use of the ethmoides is to alter the air drawn in with smells, that the species of odours may, with the air, be carried to the organs of smelling, which end in these holes; and therefore in a coryza, this bone being obstructed, the smelling is lost: also hereby the brain is purged, for phlegm is not only evacuated by the *glandula pituitaria* into the palate, but also by the *os cribrosum* into the nostrils.

The bones in the upper jaw are in number eleven, five on either side, and one without a fellow: first pair, *ossa zygomatica,* the yoke bones, is in a manner triangular, and constitutes the greatest part of the os zygomatis or jugale, and a great part of the orbita and outward angles of the eye, on the lower side. Second pair, *os lacrymalo,* is a round, little, and thin bone, in the inner corner of the eye: by this a branch of the fifth pair of nerves of the brain pass to the inner membrane of the nose. Third pair, *os maxillare,* the cheek bone, the greatest and thickest of them all; it contains all the upper teeth, and makes up the holes of the nose, and most of these bones which belong to the upper part of the face: it has large cavities on both sides very remarkable, both that it might be less ponderous, and that it might contain marrow to nourish the bones and upper teeth. Fourth pair, *os nasi,* the bone that constitutes the external and prominent bony part of the nose; it is thin, hard, solid, and quadrangular: these two bones are joined with a suture; within they are rough, that the gristles of the nose may be the better fastened. Fifth pair, *os palati,* seated at the end of the palate, where the holes of the nostrils go into the fauces or throat; they are thin, solid, and broad, and constitute the hinder part of the cavity of the palate and nostrils. Sixth, *vomer,* the bone without a fellow, like a plough; it is in the inmost and mid-

dlemost under the sphœnoides, and above the palate; it holds up the bridge of the nose like a partition wall, to which it is joined by the suture harmonia. Six bones constitute the orbit of the eye: 1. the *frontale* which makes the upper vaulted part; 2. *zygomaticum*, that on the outside, where the smaller corner is, and a portion of the os sphœnoides; 3. another on the outside, concurring with the former part of the os sphœnoides; 4, *maxillare*, and 5. *lachrymale*, which constitute the inner part; 6. the scaly table of the *os ethmoides*, which makes up the lower side, all united partly by common, partly by proper sutures.

In children, till about seven years of age, the lower jaw consists of two bones, which are joined together by *syncondroosis;* but in grown persons it is but one. The arched part of this bone is the chin; at each end of the shanks are two processes, whereof one is sharp, called *corone*, going forward, into which the tendon of the temporal muscle is implanted; the other *articularis*, because it serves for articulation with the temple bones, which articulation is covered with a common membranous ligament. Its substance is exceeding hard and strong, that it may hold out in biting and chewing; within it, there is a long cavity, where marrow is contained to nourish the teeth, and by which a branch of our fifth pair of nerves of the brain runs unto the roots of the teeth with a little vein and artery: this cavity goes quite through the jaw-bone like a pipe, so that a copper wire, put in at one end, will come out at the other. It is moveable, and contains sockets for the teeth; and in old age, when the teeth fall out, the sockets draw together, and become sharp.

The teeth are bones properly so called, white, smooth, hard, and solid, being indeed harder than other bones, that they might bite and chew hard things, not much inferior in hardness to stones. They are naked, without any periostion, yet endowed with a kind of sense, as may be perceived by cold drink, o-

when set on edge; which sense is lodged in the inner, softer, and more nervous, part. They receive into their cavities nerves, which other bones do not, and by which they are tied to the mandible with a sinneurosis. The teeth continually grow, all a man's life, because they are daily worn by biting and grinding. The cavities of the teeth are clothed with a little membrane of exquisite sense, whence it is that pains of the teeth are so exceeding vehement: they have five little nerves from our first pair, which are spread abroad within, and by small twigs mixed with the mucilaginous substance in the middle of the teeth; as also little arteries to give natural heat and nourishment, and little veins to carry back the blood after nutrition.

The tongue-bones are seated under the lower jaw, and in the uppermost part of the larynx. They are commonly accounted but one bone, though made up of three. The use of these bones is to keep the throat open both for the passsge of the food, and for receiving in of the air in speaking or breathing.

The bones of the ears are the least of all, being the bones subservient to hearing; and are four on each side. They are all placed in the first cavity; their substance is hard and dense; but hollow within, that they might be lighter, and contain marrow for their nourishment; they are as big in new-born babes as in men, but not so hard. The principal of these bones are called *malleus*, the hammer; *incus*, the anvil; *stapes*, the stirrup; and *os orbiculare*, which is round and small, joined by a small ligament to the stirrup side, where it is joined to the anvil. The uses of these bones are to serve the sense of hearing, and to make a passage for the excrements of the ears: for the stirrup, shutting the oval, is moved by the anvil, and the anvil being smitten by the hammer, and the hammer by the membrane of the drum, through the impulse of the external air, the membrane of the drum is in the mean while driven inwards, whereby the inbred air

is affected, which passing through the cochlea, causes the branches of the auditory nerve to receive the species of sounds, and to communicate the same to the brain.

The bones of the neck, and the whole vertebræ of the back, from the cranium or the skull to the os coccygis or crupper-bone, are termed *spina*, the thorn, because the hinder part of it is sharp-pointed like a thorn branch. The parts of the spine are called *vertebræ*, whirl-bones, because by their means the body is turned several ways. All these vertebræ are hollowed to contain the spinal marrow; they are many, for the conveniency of motion. The figure is sometimes inclining inwards, as the vertebræ of the neck, to sustain the gullet; and aspera arteria; and the vertebræ of the loins, to uphold the trunks of the aorta, and cava descending: sometimes outwards, as the vertebræ of the back, and a little of the os sacrum, that there may be a larger space for the heart, lungs, bladder, anus, womb, &c. The figure of each vertebræ, above and below, is plain and broad, that luxation may not easily be made: round within, convex, and bunching out; but in the neck broader, and more even.

The vertebræ of the back are in number twelve, to which as many ribs answer. These vertebræ are round on the fore-part, but behind somewhat hollow. They are thicker than those of the neck, less solid, and full of little holes for the passage of the nourishing vessels.

The vertebræ of the loins are five in number; and belong to the abdomen or lower belly: they are thicker and greater than those of the breast, because they uphold them, and the lowermost are biggest. Their figure is long and semicircular; their substance spongy, and full of holes to give passage to the veins; their connection is looser than that of the back, that we might the more easily stoop to the ground.

The *os sacrum* is broad and immoveable, being the

basis or foundation of the back, upholding the whole frame of the vertebræ. In infants it is commonly composed of six bones united by a cartilage, but in men of ripe years it seems but one bone, at the first view, yet, being boiled a long time in oil, it is divided for the most part into six several vertebræ; for each of them has a body, and processes, and has a large hole to receive the spinalis medulla. But in this they differ from the other vertebræ, because in those the lower part is the bigger, but in these the smaller; wherefore, the uppermost is the biggest, and the lowest the least. Its figure is almost triangular: in its fore-part hollow, smooth, and even; in its hinder-part, bunching and rough, with little holes to send out nerves.

The *os coccygis*, the crupper or rump bone, is under the former, consisting of three bones and two gristles, and is called os coccygis, the cuckoo's bill, from the likeness thereof. It is joined by a cartilage; for the first bone of it has a small hollowness which receives the last vertebræ of the os sacrum. Of these three bones, the lower is still the smaller; and in men, they are bent inwards to stay the great gut, and the sphincter muscle, which are tied to it: but in women they bend outward to give way to the womb in the time of travail. These bones are of a spongy and soft substance, and have neither process nor any hollowness. Their union with the os sacrum is loose, to give way for the exclusion of large excrements; for otherwise a luxation might happen, causing exceeding great pains; as in hard labour it now sometimes happens.

The *os innominatum*, the hoop-bone, or flank-bone, consists of three bones, viz. *os ilium*, *os ischium*, and *os pubis*, all which are joined together by gristles till about the seventh year: afterwards, especially in those of ripe years, the cartilages being dried, they seem to be but one bone. These three bones, together with the os sacrum, make that cavity

which is called *pelvis*, the bason or bowl, which is bigger in a woman than in a man, that the womb of a woman with child may the better rest upon it. In hard labour, the share bone, or os pubis, and the os sacrum, will part, the cartilages and ligaments (being bedewed with superfluous humidity) giving way. 1. *Os ilium*, the huckle-bone, so called because it contains the gut ilium, is the first part, the highest, the broadest, and the greatest, in figure semi-circular, arched without and hollow within: the semi-circle is called *spina*, the arched part *dorsum*, and the hollow part *costa*. 2. *Os pubis*, the share-bone, is seated in the fore-part; and is parted in the middle by a cartilage not very hard: it is joined to the bone of the other side by syncondrosis, which in women is twice as thick and as wide as in men, that these bones in child-bearing may not be luxated or disjointed, but only loosened and made wide for the coming forth of the child. 3. *Os ischion*, the hip-bone, is the lower and more outward part, wherein is a large and deep cavity, called *acetabulum*, the saucer, or *pixis*, the box, which receives the large head of the thigh-bone: the cartilaginous process of this cavity is called *supercilium*, the brow. The *coxendix* is placed between the huckle and share-bones, and is knit to the os sacrum by a double ligament; the one is inserted into the sharp process of the hip; the other behind, into its appendix, that the intestinum rectum and its muscles may be sustained.

The *costæ*, or ribs, in figure resemble a bow, or segment of a circle; their original from the vertebræ, is narrower and rounder, growing broader as they come to the breast; in their upper sides they are blunt and thick; in their under part sharp and thin: the uppermost ribs are more crooked and shorter; the middlemost are longer and broader; the lower are cut again shorter. Their substance is partly cartilaginous, and partly bony, the bony part

being towards the vertebræ; where they are furnished with two little apophyses or knobs: the first of which is articulated with the hollow of the vertebræ: the second is joined to the transverse process of the vertebræ; but the five lower ribs by a simple knob. The number of the ribs are twelve on each side: seldom thirteen, more rarely eleven: and when they are so found, you may account their numbers either supernumerary or deficient. They are twofold, viz. either legitimate and true, or illegitimate and false. The true or legitimate are the seven upper ribs, because they touch the breast-bone by their length, and make as it were a circle: they also make a perfect articulation with the breast-bone. The illegitimate or bastard ribs are the five lower ribs, which are shorter, smaller, and softer, not reaching to the breast bone: they are semi-circular and arched without, hollow within: they terminate into longer gristles than the true ribs, which, being turned back upwards, stick one to another, the last excepted, which is the least, and sticks to none. The eleventh rib, and sometimes the twelfth, are tied to the septum transversum; and sometimes the last grows to the oblique descendent muscles of the belly, without the midriff; or has the circumscription of its proper muscle. The use of the ribs is to defend the breast, and the heart, lungs, and other bowels, therein contained; as also to help the motion of the breast and parts adjacent, in sustaining the muscles and fleshy parts thereof.

The *sternum*, or breast-bone, is placed upon the fore-part of the chest, and rests upon the ribs: its substance is partly bony, but spongy and red; partly gristly; its figure is convex, broad, and long. It is composed of three bones, as may be seen in young people; but in old men it commonly appears but one: they are distinguished by transverse lines, and are knit together by synchondrosis, for gristles are interposed like ligaments. Under this is the pit

of the stomach where the upper and left orifice is, called *scrobiculus cordis.* The use of the sternum is, first, to defend the heart (like a shield) from outward dangers; secondly, to uphold the mediastinum; thirdly, to collect and fasten the ribs.

The collar bones; being in number two, are called *claviculæ*, keys, because they shut up the breast or thorax; and as it were lock the scapula, or shoulder-blades, to the sternum. They are situated cross-wise, under the lower part of the neck, on the top of the thorax on each side: externally, they are convex, on the inside a little concave: their substance is thick, but fistulous and spongy, and therefore easily broken; their superficies are rough and uneven. Their use is to assist in the various motions of the arms; as also to uphold the shoulder-blades, that they should not fall upon the breast, together with the shoulder-bone; moreover the bone of the arm rests upon this bone, as upon a prop, that it may be the more easily moved upwards and backwards. Hence brutes have no collar-bone, the ape, squirrel, hedge-hog, and mouse, excepted.

The shoulder-blade is a broad and thin bone, resting upon the upper ribs behind, like a shield. Its substance is hard and solid; its figure almost triangular, the outside somewhat arched, but the inside hollow; it has also a spine or sharp point, looking both above and beneath the cavites, called *interscapulia.* In the inside of this bone, about the middle, there is a hole, by which a vein doth pass for its nourishment. It has five epiphyses, three at the inside, and two at the basis; it has also ligaments, which join its head to the *humerus* and the *acromion*, or shoulder, to the *clavicula*; and common thin, and membranous, ligaments, which compass the joint of the shoulder-blade and arm. Its uses are, 1. to strengthen the ribs; 2. for the articulation of the *humerus* and *clavicula*; 3. for the insertion of the muscles; 4. to cover the heart, and defend the back from being hurt.

Os brachii, or bone of the arm, called also the shoulder-bone, is but one, great, strong, long, roundish, and uneven. Its substance is hard and solid; it is hollow all along within, containing marrow, but at the two ends more broad, and a little spongy. In its upper part it has an appendix, *epiphysis*, or great head, growing to it; which is round, covered with a gristle, and articulated with the *scapula* or *diarthrosis*. In the top of it is also a long chink, through which the nervous head of the musculus biceps doth pass. The longer part is articulated to the ulna and radius, where there are two apophyses; an external which is less, and crusted with a gristle; and an internal, having two cavities, representing a pulley, with which the cubit is joined by ginglymus, so that it may be bent to a most acute angle, but not extended beyond a right line.

The bones of the cubit, or elbow, are two: the smaller above, called *radius*, and a larger below, called *ulna*. They are shorter than the shoulder, have epiphyses on either side, and, resting mutually one upon another, are joined by a membranous ligament: above, the *ulna* receives the *radius;* but below, the *radius* receives it. Their substance is firm and solid: they are long, and contain a marrowy substance; but their surface is somewhat rough, by reason of the lines appointed for the muscles.

Carpus, the wrist, hath eight distinct bones, all of them unequal, and differing in shape and magnitude. At first they are gristles, afterwards spongy bones, covered with very strong gristly ligaments, which fasten them together as if they were but one bone: these ligaments, arising from the lower processes of the *ulna* and *radius*, serve for articulation: but there are angular or ring-shaped ligaments, which are transverse, and compass the wrist, to comprehend, strengthen, and safely carry, the tendons, which pass through the carpus; these are many, though they seem to be but one ligament, the inter-

nal comprehend the tendons of the muscles which bend the fingers; the external, the tendons of the muscles which extend them.

The *metacarpus*, or palm of the hand, has four bones, of a hard and solid substance, and hollow, containing marrow; they are round, and bigger than those of the fingers; that which answers to the fore-finger is biggest, and so still the lowermost are smaller. Between each bone a distance is left for the *musculi interostæi* of the fingers: and in the palm there is a transverse ligament, which ties the bones of the fingers to the *metacarpium*. Above and beneath they have epiphyses: by the upper, they are joined to the *carpus*, or wrist; by the lower, they enter into the hollowness of the fingers.

The bones of the fingers are in number fifteen, each of them having three bones, and answering the bones of the metacarpus, the thumb excepted. The thumb has no connection with the bones of the metacarpium, because it is articulate with the wrist, with a manifest motion; whereas the bones of the palm are joined to the wrist without manifest motion; as also because the upper joint of the thumb is shorter than the bones of the *metacarpium*, and not answerable to them. Each finger has ligaments on their insides, according to their length, like channels, whereby they are fastened one to another.

The thigh has but one bone, which is the greatest and longest in the whole body. In its superior extremity, the head is round, to which a slender part is added, called the neck from the neck; in it are two *apophyses* produced, to which the muscles, called *rotatores*, are fastened, and therefore they are called *trochanters*. The lower part of the thigh has two low prominences or heads, called *condyli*, a cavity being left between of a thumb's breadth, through which the vessels pass, with a nerve of the fourth pair, which cavity aiso admits the middle and eminent *apophysis* of the *tibia* or leg; in like manner

the *condyli* are received by the cavities of the leg, by a loose articulation, called ginglymus: the inner of these heads is more thick, the outer more broad and flat. The upper part of this articulation is called the knee, the hindermost the ham.

The *patella*, or knee-pan, is somewhat round, about two inches broad; plain, without having many holes, but within bunched, and there covered with a cartilage: its substance in young children is cartilaginous, but in grown persons bony; its figure is almost like a buckler or shield; its situation is upon the jointing of the thigh and leg, where the knee is compassed with a membranous ligament, the *patella* excepted. It grows to, and is fastened by, certain thick tendons of some muscles of the thigh; as the second, third, and fourth muscles, which extend the *tibia* and pass by the knee to it, and are inserted into the fore-knob of it: its use is taken from its situation, being set before the thigh bone and *tibia*, to strengthen the articulation, lest the thigh bone, in going down any hill should slip out forwards; as also to defend the tendons of the muscles.

The shank, or leg, is composed of two bones; the one, being the inner and the greater, is called *tibia*: the other *fibula*. *Tibia*, the shank-bone, has in its upper part a process in the middle, which is received by the cavity of the thigh bone. It is joined to the thigh bone by ginglymus: the *fibula* only cleaves to the *tibia*, and touches not the thigh bone. In the lower part there is an apophysis void of flesh, sticking out with a bunch near the foot, which is called *malleolus internus*, the inner ancle-bone; as the process of the fibula is called *malleolus externus*, the outward ancle-bone. *Fibula*, the button, (because it seems to button together the muscles of the shank, which is also called *sura*, the calf,) is a firm bone, being drawn along before the tibia without, as the radius before the cubit. The upper end with its round head subsists between the

knee; but with its hollowness it receives the lateral knob, which is under the epophysis in the upper end of the tibia. In the middle there is a distance between the tibia and fibula; in which space is a thin broad ligament, joining these bones in longitude, and where also the muscles of the feet are placed.

The bones of the *tarsus*, or instep, are seven. *Astragalos*, the game bone, to which are joined the great and small focile. *Pterna*, the spur of the foot, or heel bone, into which the greatest and strongest chord or tendon in the whole body is inserted. *Os naviculare*, from its likeness to a boat; it is long, bunched without, and hollow within, and covered with a cartilage. *Os tesseræ*, or the die-shaped bone, because it hath six sides; it is greater than the rest, and placed before the heel, joined to the fourth and fifth bone of the metatarsus, in the hinder with the heel-bone: the other sides are joined to no bones. *Cuneiformia, calcoidea*, the wedge-like bones, or bones of the foot, and are articulated with the scaphoides, or os naviculare: being joined, they represent a vault: for above they are convex, beneath hollow, to receive the tendons and muscles.

The *metatarsus*, or sole of the foot, has five bones, which are solid without, hollow within, longer than the bones of the back of the hand, and knit to the bones of the tarsus. That which stays the great toe is the thickest, that which stays the next toe is the longest, the next is shorter, and the rest each shorter in order. The lower end of that which stays the great toe, is received by the cuneiforme majus: the second by the cuneiforme minus: the third, by the third wedge-like bone: the other two, by the two tops of the os cubiforme.

The bones of the toes are in number fourteen: the great toe has only two, the rest three apiece. They are solid without, hollow within; and have three joints and two processes, answering in all things to the bones of the hand. The lowermost joints have

two knobs, received by the ends of the middlemost joints, but the uppermost receiveth: the uppermost joints have also a deep hollowness, because they receive the ends of the bones of the foot.

There are certain little bones called *sesaminia* or *sesamoidea*, being almost like seeds, both in form and magnitude, being for the most part in number fifty-eight. They are round and a little flat, and less in the feet than in the hands, excepting those in the great toe. 2, They are most commonly twelve in each hand, or twenty-four in both hands, and so many in each foot. They grow to the tendons of the muscles which move the fingers and toes, under which they lie, wrapped up in the ligaments, and come away in cleansing the bones, unless great care be used. The uses of these *sesamoidean* bones are to defend the tendons; to strengthen the joints, and preserve them from luxation.

The annexed Plate demonstrates the Skeleton, or Bones of the Human Body, which consist of 239, exclusive of the *sesamoideans os hyoides*, and bones of the ears; which, being added, would make the total number 308.

1. Os frontis, or frontal bone; 2. sutura coronalis, or coronal suture; 3. vertex sinister; 4. satura squamosa; 5. processus ossis sphenoides; 6. os temporis, or temporal bone; 7. processus mastoideus; 8. os mali; 9. ossa nasi, or bones of the nose; 10. 11. the superior and inferior maxillary bones: *a* vertebræ of the neck; *b* vertebræ of the back; *c* vertebræ of the loins; 12. os sacrum; 13. the sternum, or breast bone; † the costæ; 14. the clavicula, or clavicles; 15. the scapula; 16. the humerus, or arm bones; 17. the ulna; 18. the radius; 19. the carpus, or wrist; *d* the metacarpus; *e* the pollex; *i* ossa digitorum manus; 20. the os ilium; *o* the os ischium; 22. the os pubis; 23. tuber ischii; 24. foramen magnum; 25. os femoris; *r* collum ossis femoris; *s* caput ossis femoris; 26. the trochanter major; 27. the

trochanter minor; *t* the patella; 28. the tibia; 29 the fibula; *u* the talus; 30. the calcaneus · 31. the metatarsus; *z* ossa digitorum pedes

OF THE ABDOMEN, OR BELLY IN GENERAL.

THE abdomen is all that part, distinguished within (by the midriff) from the chest to the *os pubis*. It is bounded by the *cartilago mucronata*, vertebræ of the loins, *os sacrum*, hip-bones, *os pubis*, and the bastard ribs on either side. It is divided into three regions or parts: First, the uppermost, called *epigastrium*, each side of which is called *hypochondrium*, lying under the gristles of the short ribs: it is bounded between the *cartilago mucronata*. Secondly, the middle part, called *regio umbilicalis*, which extends from three inches above the navel to three inches below it: the lower part, called *hypogastrium;* the lateral parts are called *inguina*, the groins; in the right sides of which, are parts of the colon and *cœcum*, which are tied together; in the left, a great part of the *colon* and *intestinum rectum;* the fore-part of it is called *equaliculus*, and the lowest part, which is covered with hair, is called pubis, the share; the hair begins to appear here in girls about the twelth year, but in boys about the fourteenth year of age. Under this region in women are contained the bladder, matrix, and *intestinum rectum*.

The *peritonæum* is so called from stretching and spreading about, being drawn over all the parts between the midriff and thighs. Its original is from the first formation, at the third vertebra of the loins, where it is thicker, so that it cannot in that place, be separated without breaking. The muscles of the belly being taken away, the peritonæum comes to view: it is tied above to the midriff, below, to the share and flank bones; in the fore-part firmly to the transverse muscles, but chiefly to their tendons about the linea alba; behind to the fleshy heads of these

muscles. It is spermatical, cold, and dry by nature, and of a substance not simple and uniform, but double and unequal in thickness. It is a membrane double in all places, but it is most apparent about the vertebra of the loins, where, between the duplications, lie the vena cava, the aorta, and the kidnies. Its use is to send connexions to all the parts; to bestow coats upon all the bowels of the abdomen: to give a covering to the diaphragm, liver, and spleen; to produce the ligament which upholds the liver; to make a communion with all the principal parts by veins, arteries, and nerves; to produce the omentum; and, by its reduplication, the mesentery.

The *omentum*, or caul, so called, because it floats or swims upon the guts: it lies upon the peritonæum, and is situated at the liver, spleen, and bottom of the stomach: in some cases it ceases at the navel, in others it falls below the navel, and sometimes it reaches to the os pubis, where it is inserted. It is a thin membrane, endowed with much fat, double, and disjointed. In men, when it descends into the scrotum, it causes the rupture epiplocle, which happens most commonly on the left side, because it is extended rather to the left than the right side. Its substance is membranous, that it might admit dilatation and extention; it is compact, to hinder the dissipation of the internal heat, and to expel the external cold; it is tied to the stomach, being a middle part between the colon and the spleen. Its uses are to cherish and strengthen the internal heat of the stomach and intestines, to give nourishment to the parts in time of famine; to contain the humours flowing from the intestines, which the glandulous cannot receive wholly at one time; to prop up the branches of the veins and arteries of the stomach, duodenum, colon, and spleen: and to generate the fat.

The stomach, called *ventriculus*, from its cavity is situated in the epigastrium, a place encompassed with

no bones, that it might stretch the more easily, immediately under the midriff, which it toucheth, so that if it be too full, it causeth a difficulty of breathing, by hindering the motion of it. In the forepart and on the right side, it is covered with the hollow of the liver; in the left by the spleen; so that the stomach is as it were between two fires, bending a little towards the left hypochondrium, and towards the back part it leans on the aorta, the cava, and the pancreas, which helps its heat. It is less in women than in men, to give way to the distention of the matrix, and it is composed of three tunicles; the outwardmost is common from the peritonæum, and is the thickest; the middlemost is proper to itself, and fleshy; the innermost is from the *dura meninx*, and wrinkled, as also hairy like a piece of silk; this is continued with the tunicle of the œsophagus, mouth, and lips, that nothing may be received in which is ungrateful to the stomach: hence it is, that, when choler is in the stomach, the tongue is bitter and yellow. It is spongy, and has passages like short fibres, from this inner surface to the outward, that the inner chylus may be the better detained. The inmost coat serves chiefly for sense; the middlemost for the office of motion; and the third, that it might be as a covering for the whole. The stomach has two orifices, and both of them in the upper region thereof; the left is called *os stomachi;* the right, the *pylorus*, or porter: the *os stomachi*, or left orifice, has orbicular fibres, that, the meat and drink being once received within the capacity of the stomach, it may, by a natural instinct, exactly shut up the mouth of the stomach, lest the fumes and heat should break out which might not only go into the brain and breed diseases there, but also hinder concoction. The right orifice is of equal height with the other; lest the meat and drink should slip through before they are digested. It is not wide like the former, because it is to transmit the elaborated chyle, which is done by

the strength of the stomach, in contracting itself. Wherefore the *pylorus*, besides its transverse fibres, has a thick and compact circle, representing the sphincter muscle, that it might the more easily shut and open. The stomach has arteries from the *ramus cœliacus*, which accompany every vein, that blood may be supplied from the heart for nourishment of the part: it has likewise many nerves; viz. two in its orifice from the stomach branches, which being produced, after they have run back in the thorax, and furnished the lungs and pericordium, are covered with strong membranes. These so cross one another, that they are carried obliquely, and without doubt with greater safety. The right branch compasses the fore and left part of the mouth of the stomach; and left branch, the hinder and right part of the same: from these branches of nerves are sent downwards, to the very bottom; a branch goes from the left nerve, along the upper parts of the stomach, to the pylorus, which it unfolds with certain branches, and goes to the hollow of the liver: other two nerves also go to the bottom of the stomach, from the branches which run along by the roots of the ribs. Hence it is, that when the brain is hurt, the stomach is sick, and falls a vomiting, as in a vertigo hemicrania, &c. also, when the stomach is affected, the head and brain are ill, or afflicted with pain; and by reason that the orifice of the stomach is so compassed with nerves, as if it were altogether made of nerves, it becomes of a most exquisite sense; and hence it is that vomiting succeeds in many diseases, where there is a consent of parts with the stomach. The stomach is the seat of hunger, and the first of all parts feels the want of food; (afterwards the other parts by faintness and universal debility;) for the blood being spent upon the nourishment of the body, the fibres of the internal membrane of the stomach are contracted, and so this pain, which is called hunger and thirst, is caused.

The intestines, or guts, begin at the pylorus, and

end in the anus or fundament. They are called *intestina*, or inwards, because they are in the inmost seat of the body. They are of a round figure, that they might the better contain the nourishment; of a membranous substance, the better to have constriction and dilatation; and indeed their substance is almost the same with the stomach, having three coats, one common and external, being bred immediately from the *mesenterium*, but mediately from the *peritonæum*. The second, which is the middlemost, is proper, being membranous, strong, and furnished with fleshy fibres.

The third, which is the innermost, is also proper, nervous, and lined with a crusty substance, framed of the excrements of the third concoction of the guts, glazed as it were with a mucus or phlegmatic substance, bred in the first concoction, by which excoriation is not only hindered, when sharp humours pass through the guts, but also by its assistance the expulsion of the fæces is furthered. This internal membrane has such a crusty substance, that the mouths of the meseraic veins might not be stopped; and that neither they nor the coat itself might be made callous by the continual thoroughfare of the chyle. The fibres of the internal membrane of the small guts are oblique, but of the external, transverse; because these are appointed for the retention and expulsion of the chyle; but in the thick guts the inner coat has transverse fibres, the outward has oblique and straight, because they are appointed for the expulsion of the excrements: the inner membrane also of the small guts is full of wrinkles to stay the chylus from passing too soon. As to the length of the intestines, they are in general six times as long as the whole body: it is wonderful that the guts (of so great a length) should be comprehended in so small a compass, so as that they are not above a span distant from the centre. They have a motion, which is peristaltic, or the worm-like motion, by which

they move themselves all over by a contraction from the upper parts downwards; moreover they have many turnings and windings or bendings, which serve to keep the nutriment, till the concoction is perfectly finished, and chyle distributed.

The *mesentery* is so called, because it is the middle of the guts. It is one in number, but divided into two parts, the *mesareum mesocolon.* By the *mesareum*, the small guts are knit together; by the *mesocolon*, the thick guts are tied together. The substance of the mesentery is a double membrane, one above another. Its situation is in the middle of the abdomen, sticking to the transverse processes of the vertebra by ligaments, whence it is original: for it arises from the first and third vertebra of the loins, where membranous fibres are produced from the peritonæum, which turn into strong membranes. The vessels of the mesentery are veins, arteries, and nerves, which pass to and from the guts, between the membranes. The veins are called *meseraicæ*, and they are two-fold, viz. *sanguinaæ* and *lacteæ*, both which are almost innumerable. The *venaæ sanguineæ* or *meseraicæ*, receive the blood from the arteries, after nourishing of the parts, and so convey it back again to the liver. The *vena lactæ*, ascending from the guts, and carrying the chyle, do centre in the glandules, or receptacles of the chyle. These glandules of the mesentery, are to prop up and support sundry distributions of the branches to the *vena porta* and *arteria magna;* and hence it is, that about the centre of the mesentery are the greatest kernels, because there is the distribution of the greater and more collected vessels: if those become schirrous, an atrophy, or extenuation of the whole body, viz. a wasting, leanness, and pining follows, because the passing of the chyle is hindered, whereby the nourishment of the body is lost. Their substance in men is glandulous and solid, like other glands of the mesentery, watered as if it were with the *vena lactæ*, yet capa-

ble of chyle in their least corners. Their connexion is in the hinder part *vertebræ lumbares:* in the fore-part they are joined to the mesentery by small milky branches, which carry the chyle to these fountains or receptacles. The use of these milky glandules is to receive and contain the chyle coming from the *venæ lactæ* of the mesentery; as also to digest and prepare it by the help of the neighbouring hot vessels, viz. the artery and vein, and then, being prepared, to thrust it out into the *thoraices*, and other parts, as the liver, which is easily proved by ligature; for if these *lactæ*, whether in the thorax or going to the the liver, be bound, they always swell on that side next to the glandules or mesentery, and grow empty on the other sides; they also squeeze out the serum, being separated from the chyle in that light preparation, and expel it either into the reins adjacent to them; or into the emulgent arteries, to which they send branches; or into the capsulæ atribilariæ, appointed for melancholy: or, lastly, into the doubling of the peritonæum, in which they abide, which is sometimes the cause of the dropsy ascites: and herein we have reason why a dropsy is many times ended by diuretics and dissolved by urin; and how those, who are extreme drinkers do so immediately evacuate what they have drunk; for that the ordinary way through the liver, heart, arteries, emulgent veins, ureters, and bladder is vastly longer, and more tedious: hence also the cause is seen, why in a real diabetes, the drink is so voided through the bladder in a very short space, as it is received, without change of consistency, colour, taste, or smell; hence too appears the reason of an *atrophia* of the parts, especially those of the thorax, which draw the chyle out of the milky receptacles; for that they are sometimes pressed together: whereby the distribution of the chyle is obstructed; sometimes also they are inflamed, tumified, and afflicted with a *scirrhus*. Hence it is that lithontriptic or nephritic medicaments do pre-

sently ease such as have a pain in their reins: as likewise cantharides, and such as incite to lust, do immediately, without stopping the passage, come to the arteries, emulgent and spermatic; because that, in the accustomed journey, (much the longer way,) the virtue of the medicaments would easily be enervated. And here the reason is obvious why diuretic and nephritic medicaments make such an impression of smell and colour in urine, as is manifest in cassia, turpentine, juniper, asparagus, and other like things. Many of the *lactæ* of the mesentery, coming through the greater glandules, and the sides of the *portæ*, are grafted into the liver. Their entrance is about the third lobe, to which many of the *lactæ* from the mesentery and *appendices* of the stomach do come. From the upper part of the milky glandules, immediately under the *diaphragma*, there aries as many milky branches as there are glandules, which through the middle of the spina, pierce the *diaphragma*, and, by mutual insertion, two of them are joined about the first *vertebra* of the loins; another branch coming out of the second glandule, about the twelfth *vertebra* of the back, enters a little above the other insertion; but the third, rising from the third glandule, is to be seen near the eleventh vertebra, from whence it arises as a solitary branch, through the middle of the back by the side of the *aorta*, and the vein *azygos*, between both, under the *œsophagus*, to which it is firmly knit by its membranes. These milky *thoracics* departing from the spinal, (about the third or fifth vertebra of the back,) through the midst of which they crept all this way, turn a little to the left, and creeping up under the *œsophagus*, and *aorta*, and under the *subclavial* artery and the glandules of the *thymus*, they go forward to the left *clavicula* and left axillary vein, they enter the vein just where the outward jugular pours itself forth into the axillary aforementioned. From hence we learn, that these *thoracics* carry the chyle out of the milky glandules

or receptacles of the mesentery to the subclavials; but the *lactæ meseraicæ* carry the chyle from the intestines either to the receptacle or to the liver: also that the chyle goes not to the head nor to the joints, but is carried to the heart with blood that runs down in circulation, where it is changed into the sanguineous humour; and hence the *lactæ* of the *thorax* receive their restorative force from nutriment, cordials, and medicaments, out of the stomach or *œsophagus*, by the *glandulæ lactæ*, and carry them straightway to the heart: whence it is, that drinking vinegar, wine, cordials, and other like things, so immediately cause the strength to be restored; and presently at meat a man is strengthened, and his hunger stayed; this virtue is conveyed by the milky branch which is near the *œsophagus*, and the short passage of the rest or the lactæ to the heart: also vulnerary potions and pectoral drinks come a shorter and surer way to the heart and lungs, to which, by the long way about through the bowels and veins, they could not come so safe and secure; and by the same reason poisons swiftly overcome the heart, infect the vital spirits, and destroy their harmony.

The liver is an organic part, and an instrument of the blood, (both for generating and perfecting it,) seated in the abdomen, just under the *diaphragma*, or midriff, in the right *hypochondrium*, about a finger's breadth distance therefrom; is covered by the ribs for safety, but covers, or lightly rests upon, a great part of tne stomach. It is divided as it were into two parts, by the umbilical vein, which after the birth serves it for a ligament. It is said to be the original or beginning of the veins, because therein the roots of the two greatest veins appear dispersed, viz. of the cava and portæ, as roots implanted in the earth; also here are to be seen inserted, trunks and branches of the vena lactæ, arising from the *pancreas mesenterii*. It is a great, thick, and hard body: of a red colour, consisting of a substance proper to it-

self, fitted and ordained for that end. It differs from the livers of beasts in that it has seldom any lobes, yet the hollow part of it has a fissure or a chink, where the umbilical vein is implanted. Its magnitude is exceeding great, beyond all the other viscera; and bigger in man than in any other living creature, the proportion of body being considered; and this seems to be necessary, considering the noble uses and functions to which it is ordained. The action of the liver is sanguification; for the chyle, being conveyed to the liver by the vena lactæ, is there sanguified, or made chymus; for the substance of the liver doth not only sustain the veins, but is also the efficient of sanguification, and of perfecting the blood by its circular motion: and, together with the blood it generates natural spirits.

The gall-bladder and choler-chuated are situated on the right side of the liver, in the under or hollow part thereof. The branches of both these, together with the branches of the vena portæ, are comprehended in a common bladder, called *capsula*. These branches of the *vesica fellis*, and *ductus choledochus*, or *biliarius*, being detained in the liver, are dispersed through its whole *parenchyma*, every where included in the aforenamed *capsula*, which is red, about the thickness of an artery, and takes its original from the peritonæum. The gall-bladder is a vessel long and round, much like a pear, hollow, furnished with a double membrane. Its magnitude is small, compared to the spleen or kidneys, being about two inches in length, and in some persons nearly three inches. The use of the gall is, 1. to cause a new and more perfect fermentation of the chyle: 2. to prick the guts by its sharpness, to stir up their peristaltic motion, that they may drive down the chyle and expel the excrements: 3. to mix with the chyle in such proportion, that, being converted into blood, the blood might thereby be kept from coagulation.

To illustrate the subject more amply, we have sub-

joined a representation of the liver of a new-born child, where A A A A represents the circumference of the liver: B B B B, the lower part of the liver, in which there are several irregularities; C, the gall bladder; D, the umbilical vein, running with a single trunk from the navel to the liver; E E E, the sinuses of the vena portæ, into which alone the umbilical vein inserts itself with a single trunk; F, the trunk of the vena portæ cut off; G G G G, the principal branches of the sinus of the vena portæ distributed through the liver, which becomes conspicuous when a small part of the superficies of the liver is abraided off; H the trunk of the vena cava; I I, the canalis venosus, or ductus venosus, arising from the sinus of the vena portæ, over against the ingress of the umbilical vein, and inserting itself into the vena cava; this, in the uterus, carries a great part, and probably the greater part, of the blood, carried through the umbilical vein to the liver of the fœtus, by a large passage to the vena cava and the heart; but this, after the birth of the fœtus, gradually grows narrower and closes; K, the entrance of the umbilical vein into the sinus of the vena portæ. To this description of the external part of the liver, it may not be improper to add that of its blood vessels, together with their numerous ramifications, freed from the parenchymatus substance. Fig. 1. represents the under side of these vessels; A being that part of the liver which lies next to the back; B its right side; C, its anterior edge; D, its left side; E, the vena cava, where it passes through the diaphragm; E 1, E 2, E 3, its three principal branches, distributed almost through the whole liver; F, the vena portæ turned upwards, that other vessels may be more easily seen: F 1, F 2, F 3, F 4, four branches of the vena portæ distributed to several quarters of the flat part of the liver, but the fifth branch is not observed on this side; G, the gall bladder; H H, the vena umbilicalis, become a ligament; I, the ductus communis choledochus; K, the chana-

lis venosus, now performing the office of a ligament ; L, the trunk of the vena cava descendens ; *a*, a small portion of the membrane investing the liver ; *b*, that part of the diaphragm which surrounds the vena cava; *c*, the biliary duct ; *d*, the cystic duct ; *e*, the place where these vessels meet : *f*, the hepatic artery ; *o o*, the hepatic nerves ; *p p p p*, the common capsula laid open ; *q q*, the lymphæducts ; *m m m*, &c. the smaller branches of the vena portæ ; *n n n*, the small branches of the vena cava.

The spleen, or milt, is situated in the left side under the short ribs, over against the liver, and under the midriff, between the ribs and the stomach, near to the back part. Its colour in new-born infants is red, because they have been fed with elaborate blood, but in those of a ripe age it is of a darkish red colour, and sometimes almost blackish. It is connected by thin membranes arising from the peritonæum, to the peritonæum itself, caul, and to the left kidney, and sometimes also to the septum or diaphragma. The action and office of the spleen is not to be either the receptacle or the place of the regeneration melancholy, (as several learned men have thought) nor to make blood, (as many others have imagined,) but to highly perfect the blood already made, that it may serve as a *fermentum*, both to the daily generated chyle and all the rest of the blood in the body : the excrementitious blood, which cannot be separated from the spleen, if it be thin and watery, is purged out, first by the arteries, not only to the guts, but also the kidneys by the emulgent veins ; hence, in diseases of the spleen, the urine is many times black, in which case we commonly administer diuretics. Secondly, by the stomach ; whence, in the scurvy and a quartan ague, the sick spits exceedingly ; but, if this excrementitious blood be thick and earthy, it is voided directly by the anus by proper arteries from the gut, by which means the ordure is black, as also by the internal hæmorrhoidal veins, as the great Hippocrates has often shewn.

The reins, or kidnies, are situated under the liver and spleen, by the loins, between the two coats of the peritonæum, at the sides of the cava and aorta, under which very great nerves lie hid, and rest upon the muscles of the thigh: whence it is that a stone being in the kidnies, a numbness is felt in the thigh and leg of that side. The left kidney is for the most part highest: the right is lowest to give way to the liver, reaching by its end the third vertebra of the loins. They consist of a substance, solid, fleshy, thick, hard, and compact, almost as the heart, but not so fibrous. They are connected by an external membrane from the peritonæum to the loins and diaphragm: by the emulgent vessels to the cava and aorta: and by the ureters to the bladder. The right kidney is tied to the cœcum, sometimes also to the liver: the left to the spleen and colon; hence pains of the reins are exasperated by plenty of wind and excrements. The colour of the flesh of the kidnies is red; and through their hollowed sides are carried the emulgent veins and arteries, proceeding from the trunks of the cava and aorta: they have also emulgent arteries, which are large, and derived from the trunk of the aorta, which carry blood for nourishment, and that therefrom the *serum* (which is plentiful in the arterial blood) may be separated; they have also one very small nerve on each side, which springs from the ramus stomachicus, proceeding from the par vagum, and is inserted into the proper membrane of the kidney; whence arises the sympathy between the stomach and reins; and that they who are diseased in the kidnies, by the stone or some other distemper, are for the most part sick at stomach, and troubled with vomiting. The use of the kidnies is to attract the sanguineous serocity by the emulgent arteries, that so the mass of blood may be cleansed: which blood, going through these vessels, is always carried through the branches of the emulgents, disseminated through the whole parenchyma of the kidnies, and

runs at length into very small passages, so that at last the wheyish humour is thrust quite out into the flesh of the kidnies: the good blood remaining partly to nourish them, and partly to return by the little emulgent veins, which are open into the cava, and so to the heart. The serious part is strained through the papillary caruncles, which have holes into the branches of the ureters, and after grow together into one cavity or expansion of the ureter, into which the serum is emptied: through the ureters it passes into the bladder, where it becomes urine.

The *deputy kidnies*, or black choler cases, are so seated that they rest upon the upper part of the kidnies, on the outside, where they look towards the *vena cava*, being covered with fat membranes. In figure and substance they for the most part resemble the kidnies, save that their flesh is a little looser: so that they seem like little kidnies resting upon the great ones. They have an apparent internal cavity furnished with a dreggy and black humour: and are strongly connected, where they rest, to the external membrane of the reins, and to the *septum transversum*, to which they commonly stick in dissection.

The *ureters* are white vessels, like veins, but thicker, whiter, and more nervous; consisting of a single membranous substance, inclosed in a duplication of the peritonæum. They are as long as between the kidnies and bladder, and commonly as thick or wide as goose quills: but, in dissection of persons troubled with the stone, they have been so wide as to admit of two fingers. Their original is in the kidnies, within whose cavities they are divided into nine or ten little pipes or channels, which are fitted to the little fleshy teats or *caruncul*æ *papillaries*, that they may distil the serum into the pelvis, or bason, or large cavities of the ureters within the kidnies. The ureters descending within the duplicature of the peritonæum, upon the muscles of the loins, to the bladder, are inserted obliquely into its

neck; then, ascending upwards between its membranes, they perforate the innermost coat together, and through the same hole they both enter the bladder: in the implantation of the ureters, two little membranes or valves are placed, like the valves in bellows, shutting up the passages of the ureters, so that the urine cannot go back. They receive small veins and arteries from the neighbouring parts, and nerves from the *par vagum*, and marrow of the loins. Their use is to convey the urine from the kidnies into the bladder.

The *bladder*, or receptacle of urine, is seated between the duplicature of the peritonæum, in the cavity of the hypogastrium, which is called *pelvis*, or the bason; which in a man lies between the os pubis and intestinum rectum; in a woman, between the os pubis and the neck of the womb. Its figure is oval or globical, that it might hold the more; from the bottom it is by little and little straightened into a narrow neck. Its magnitude is various; and, according to the greatness of the lungs, such is the greatness of the bladder; and such animals as have no lungs have no bladder: man according to his magnitude, has of all living creatures the greatest bladder. Its substance is partly membranous, for strength sake, as also that it might extend and wrinkle together. It has two membranes and one muscle, which most anatomists make to be a third membrane, and not a muscle. The bottom is fastened to the peritonæum, and to the navel by a middle ligament, called *urachus*, and the two navel arteries dried up. The neck of the bladder is tied in men to the *intestinum rectum;* but in women to the *vagina uteri*, or the neck of the womb, and to the neighbouring hip-bones. The bladder has three holes; two a little before the neck, where the ureters are inserted, and a third in the neck, through which the urine is voided. The neck is fleshy and fibrous, furnished with a sphincter muscle to purse it up, that the urine

may not pass out against our will; in men this neck is long, narrow, and wreathed, because, being placed under the bodies which constitute the yard, it runs upwards under the share-bones, from the fundament to the origin of the yard. In women it is short and broad, stretched forth downwards, and implanted above into the neck of the womb. The bladder has arteries from the hypogastrica in men, and from those which go from the neck of the womb in women; by these it is nourished; it has veins also from the vena hypogastrica implanted into the sides of its neck, variously disseminated through the bladder, which are mutually conjoined one with another, and with the arteries by open holes, that nutritive blood may return; and it has nerves from the par vagum, and from the medulla of the os sacrum.

The spermatic vessels in men, called *vasa preparentia*, are two-fold, viz. the two spermatic veins, and the two spermatic arteries. The right-side vein springs from the trunk of the vena cava, a little below the rise of the emulgent, otherwise it must go over the aorta, and then there would be danger of breaking; or at least, by reason of the pulsation of the artery, the venal blood might be hindered. Both the seminal arteries arise from the trunk of the aorta about two inches distant from the emulgents; these vessels, being a little distant one from another, are tied together by a thin membrane from the peritonæum. These spermatic preparers are greater in men than in women, and the arteries are greater than the veins, because very much heat, vital spirit, and arterial blood, are requisite to make seed. These vessels are carried obliquely above the ureters to the groins; but in their progress they are joined by infinite anastomoses or inosculations; so that the arteries are so coupled within the coats of the veins, as if they were but one vessel, and they are knit together by a membrane arising from the peritonæum, and afterwards carried to the beginning of the testicles.

like a tendril of a vine, being so interwoven that a curious eye cannot distinguish a vein from an artery. This intertexture of veins and arteries being the twistings of the vasa preparantia, makes a long, thick, glandulous, but hard, cord, called *corpus varicosum*, which is without any remarkable cavity. These vessels do not pass through the peritonæum, as in dogs, but are carried between its double coat with a small nerve from the *par vagum* and the muscle *cremaster*, and, passing to the bottom of the testicle, end at the *vas deferens*. These arteries carry blood and spirits (in whose admirable windings they are more elaborated) to the testicles, from whom they have a virtue seminal: with this blood the stones are nourished, and part of it becomes seed; the veins are closely interwoven with the arteries about the testicle, and joined to them by mutual anastomose; that they may carry back the blood which remains under the left emulgent, or to the vena cava on the right side, from whence the spermatic vein commonly springs. If one or both the spermatic arteries be injured, or wanting, as they are sometimes, such persons doubtless cannot get children, but must necessarily be barren.

The *testicles* in men, are glandulous bodies, flaggy, spongy, soft, and white, without any cavity, full of small veins and arteries, such as are not in any other part of the body. Their figure is oval, but it sometimes varies, according to the turgency of any of the neighbouring vessels. The right testicle is hotter, and better concocts the seed, than the left: because the former receives the arterial blood immediately from the aorta, the latter from the emulgent. They are seated externally without the abdomen, under the belly, at the root of the yard, in the scrotum or covering: being commonly in men answering to the bigness of a small hen's egg. The membranes being taken away, the substance of the testicle comes in sight, upon which athwart, is placed a small body, called *corpus vermiforme*, to the one end whereof

cleaves the *vas spermaticum deferens*, the carrying spermatic vessel which enters into the substance of the testicle, and empties the seminal matter thereinto; from the other end arises the *vas ejaculatorium*, which in the beginning is full of turnings and windings, and cleaves firmly to the testicle by its end, being loose, and separate in its middle. They have vessels of all sorts, veins and arteries from the seminal vessels, and a large nerve from the *par vagum;* sometimes also they have two nerves from the twenty-first pair of the spinal marrow, which being conjoined with the spermatic vessels, are carried with them through the production of the peritonæum, and disseminated into the tunicles. They have on each side one proper muscle, called *cremaster*, or, *suspensor;* and a common muscle, from the membrane of the scrotum, called *dartos.* The testicles have also several tunicles, coats, or coverings; of which two are common; three proper to themselves only. The first coat, (which is to defend the part,) is constituted of the skin and scarf-skin, and is called scrotum, or *bursa scroti*, because it is like a purse or bag: it is soft, wrinkled, and void of fat: having in its lower part a line according to the length thereof; which divides into a right and left part, and is called *sutura*, or a seam. The second common coat consists of a fleshy membrane, springing from the membrana carnosa, which is here thinner than in other places, and full of veins and arteries, and is called *dartos:* this by many is comprehended under the term *scrotum.* The first proper coat is called *vaginalis*, the scabbard coat; and *elicoides*, from its thinness, which is yet strong, and full of veins, arising from the processes of the paritonæum, and cleaving to the dartos by many membranous fibres, whence its exterior part is rough, its interior smooth. The second proper coat is called *erythroides*, because of its redness: it has some fleshy fibres from the cremaster, from which it is propagated, and is spread

over the vaginalis. The third and innermost, called *albiginea*, arising from the coats of the spermatic vessels, immediately encompasses the substance of the stones, and as it were binds the same, being white, thick, and strong. The use of the testicles is to elaborate the seed, and to make it by their heat and inbred faculty: for the efficient cause of the seed is the proper parenchyma of the testicles, both in regard of their hot and moist temper, and of their specific property; for, the blood being prepared, they convert it into seed; what remains over and above serves for nourishment of the part, and the remainder is conveyed back, by the spermatic veins, to the heart.

The *vasa deferentia* are the vessels carrying away the seed; and these begin at the testicles, and end at the root of the yard, whither they carry and ejaculate the seminal humour; being in number two, on each side one. Now these *vasa deferentia*, called also *meatus seminales*, are divided into three parts; the beginning, middle, and end; under which are comprehended the *parastatæ*, the *vasa ejuculatoria*, the *vesiculæ seminales*, and the *prostatæ*. The *parastatæ*, or assistants, are the beginnings of the *vasa deferentia*. Their substance is of the middle nature, between that of the testicles, and that of the *vasa ejaculatoria*, being within glandulous and spongy, but without membranous. They have their origin in the stones, making many anastamoses there, with the *vasa preparantia*, by means of innumerable small pipes or white fibres. The use of the *parastatæ* is to perfect and finish the seed, by a virtue which they receive from the testicles; and while the seed is lodged in them, frequent lust is not provoked. The *vasa ejaculatoria* are the middle of the vara deferentia, properly so called; these convey the seed from the parastatæ or corpora variosca to thevesiculæ seminales. Their substance is white and nervous: their figure long and round, with an obscure cavity

or hollowness: their situation is partly in the testicles, partly in the cavity of the abdomen, above the os pubis or share-bone, for they run upwards, and are knit to the vasa preparantia by a thin membrane, and so are carried along to the flanks and share-bone, which for that purpose have a slight cavity. After being turned back downwards, they pass above the ureters, and under the hinder part of the bladder; above the *intestinum rectum*, at the neck of the bladder, they are at each side widened, and there constitute the seminal bladders. *Vesiculæ seminales*, the seminal bladders, are the end or termination of the vasa deferentia: after the constitution of these bladders, these carrying vessels are united into one small passage, and are inserted into the prostatæ. The bladders are many in number like little cells, and seem to make on each side one remarkable great and winding one, for that they go one into another, much resembling a bunch of grapes. Their substance is nervous, and they are seated between the ligaments of the bladder and the rectum, by the sides of the vasa ejaculatoria, a little before the said vessels grow thick and unite. Their use is to contain the seed being perfected, and to reserve the same till the time of coition, that so there may be a sufficiency for generation. The *prostatæ*, standers before, stoppers, or conductors, are two certain caruncles (in which the vasa deferentia terminate) manifestly differing from the vessiculæ seminales in use, form, situation, and magnitude. Their situation is at the root of the yard, above the sphincter of the bladder, on each side at the neck thereof. Their substance is spongy, yet harder and whiter than other kernels, and they are also covered with a thicker membrane, being of exquisite sense, that they might cause pleasure in coition. They are flat before and behind, but round on the sides; their magnitude is usually as big as a walnut, and they are open by certain pores into the urethra or urinal passage, which is evidently appar-

ent in such as have died of a gonorrhea, where they have been dilated, and in whom the seat of that disease did lodge. Their use is to contain a viscous and slippery humour, to moisten the urethra, for the more easy and speedy passage of the seed; and they also serve to stay the involuntary effusions of the seed, and to hinder its regurgitation being once emitted. They terminate in a small caruncle upon the urethra, which as a valve serves to hinder the coming of urine into them: under and by this caruncle, on each side, there are inconspicuous holes or pores, through which the seed passes into the urethra, just as quicksilver passes through leather, which it does by virtue of its being replete with a vast quantity of subtil and penetrating spirits. In these pores of the prostatæ, and in the seminal bladders, the seat of a virulent gonorrhea lies; and, therefore, if they be broken, hurt, or dilated, either by a catheter putting into the bladder, or by any other means, there follows immediately an incurable gonorrhea. The distance between the root of the scrotum and the podex is caled *perinæum;* this as well as the pubes and scrotum, is furnished with air, because glandules are placed here which abound with plenty of humidity, a part of which they send to the skin for the generating thereof.

The *penis*, or yard, is an organical part, long, and roundish, but broader on the upper side than where the uretha is, being the male instrument of generation, and appointed for the evacuation of the seed and urine. It is seated under the os pubis, exactly in the middle, because it is only one in number. Its magnitude is extremely various in different subjects, being for the most part larger than ordinary in little men; also in such as have large noses, for the proportion of the yard very much answers that of the nose: in such as have thick, full, large beards: and in Ethiopians, or blackamoors. It consists of a scarf-skin, fleshy membrane, and a proper substance of its

own; but it is void of fat even in the fattest men, lest thereby its most exquisite sense should be dulled. Its proper substance is four-fold: first, the uretha; secondly, the glans; thirdly and fourthly, the two nervous bodies, one on each side. The *urethra*, or passage of the urine and seed, is a pipe of a nervous substance, of the same bigness from the neck of the bladder, (to which it is joined) to the end of the yard or beginning of the glans, for in the middle of the glans it has a greater hollowness. Its substance also is thick, loose, and soft, like that of the two laterial ligaments or nervous bodies. This urethra has also two membranes, and a substance proper to itself. The one membrane is internal, thin, and of exquisite sense, with which also the glans is covered; this springs from the thin membrane which clothes the nerves of the yard; the other is external, more thick and fleshy, and furnished with nerves: the middle part, which is its proper substance, is loose, spongy, and black, that may be distended or contracted with the other parts. In the beginning of its channel are these pores through which the seed is ejaculated, as also a little membrane or caruncle like a valve stretched before it, to keep the vessel and urine from returning into the spermatic vessels; if it be broken or corroded by sharp humours, or the unskilful use of a catheter, there follows an incurable gonorrhea. Its use is to be the common passage of the urine and seed. *Bolanus*, glans, the head or nut of the yard, is an hollowed kernel, wider in the middle than at the external orifice; of a globular form, even, and compassed with a circle or crown. Its substance is flesh more solid than the rest of the yard, of a most exquisite sense, and covered with an exceeding thin membrane, soft and red. It is covered with the duplication of the external skin of the yard, called *preputium*, (a *putanda*, from cutting off,) the foreskin: this is that which the Jews cut off in circumcising. The skin is tied at the root of the glans by a certain

ligament, called *frœcum*, the bridle, arising from a combination of the tendons of the yard and a nerve, terminating in the extreme hollowness of the nut. The two nervous bodies, or hollow ligaments, one on each side, constitute the remaining and greatest part of the yard; the whole substance whereof being like a thick spongy artery, stuffed with flesh. Their external substance is long, thick, compact, hard and nervous; their internal substance is spongy, thin, hollow, of a net-like texture, framed of innumerable twigs of veins and arteries of a dark red colour, inclining to black, and filled with a great abundance of black blood, very full of spirts, which, waxing hot, causes a distention and erection of the yard. These two bodies (where they are thick and round) spring from the lower parts of the share-bone, or hip bones, to which they are strongly tied with two ligaments. In their beginnings they keep some distance, being separate one from another, almost like a Y, that the urethra may pass between them; but, when they cease to remain perfectly separate, viz. when they come to the joining at the share-bone, they lose near a third part of their nervous substance; yet they still remain distinct by the coming between of a single membranous partition, called *septum lucidum*. This membrane is white, thin, transparent, and full of nervous fibres: it arises from the upper part of the commissure of the os pubis, and upholds the said two lateral ligaments, and the urethra as a stay, the like of which is also found in woman. The yard has all sorts of vessels, as veins, 1. external, running up and down the skin, from the pudenda; 2. internal ones, from the venæ hypogastricæ, which are spread through the whole body. It has arteries, two internal remarkable ones, arising from the hypogastricæ, which are inserted into the beginning of the growing together of the two nervous bodies, which are scattered up and down according to the length of the part; but in the middle, where

the septum lucidum is thinnest, they send branches through the spaces of the fibres, the right artery, into the left nervous body, and the left into the right, carrying spirits and blood to fill up, erect, and nourish the yard. It has two nerves from the marrow of the *os sacrum*, which disseminate themselves through all parts of the yard, both internal and external; ascending through the middle of the forked division, they spread themselves into the muscles, the whole body of the yard, and the glans, that there might be an exquisite sense and delectation. It has also four muscles, two erectors, and two accelerators, or ejaculators, under which muscles lie hid the two nervous bodies.

The spermatic vessels in women are the same with those in men, and agree in the number, nature, original, and offices; but they differ from those in men in the following things; first, in longitude; in women they are shorter, by reason of the shortness of the passage, but they have more wreathings, windings, and turnings, where they make the corpus vericosum about the testicle, that the seed may have a sufficient stay for its due preparation; secondly, in their insertion; in woman they pass not whole to the testicles, as in man, but are divided in the midway; whence the greater part goes to the testicles to form the corpus varicosum, the smaller part to the womb, into whose sides it is disseminated, especially to the upper part of the bottom, to nourish the womb, and the child therein; and that by those vessels some part of the menstrual blood may be purged forth in such as are not with child. This smaller part is tripartite, being divided below the testicles into three branches, of which one runs out into the womb, as aforesaid; the second is distributed to the *vas deferens*, or trumpet of the womb and to the round ligament: the third creeps along the sides of the womb, insinuating itself among the venæ hypogastricæ with which and the arteries they are joined by

anastamoses; thirdly, the spermatic veins receive the hypogastric arteries as they pass by the sides of the uterus, that the blood might be the better elaborated; and they are intermixed with many wonderful anastamoses for the preparation of the seed.

OF THE THORAX.

THE thorax, chest, or breast, is that which is called the middle ventricle, being circumscribed above by the clavicula; beneath by the diaphragma; on the fore-side by the sternum; on the hinder part by the back-bones; and on each side by the costæ or ribs. Its situation is between the upper ventricle or head, and the abdomen, being the seat of the vital spirits, and consisting of the parts appointed for cherishing the natural heat. Its figure is almost oval, somewhat flat before and behind, whereas in beasts it is somewhat sharp, so that of mankind only lies on the back. Its substance is partly bony, partly fleshy; bony, because it contains not any parts much to be distended; fleshy, because it contains parts which ought to be moved, as the heart and lungs.

The breast or dugs, are common to both sexes; in men they are framed of the cutis, the membrana carnosa, fat and the nipple, and are called *mammillæ* The dugs in women have besides many remarkable vessels, glandules, and pipes to make and contain milk. The nipple or teat, called *papilla*, is spongy, like the glans of a man's yard, and perforated through the middle with many small holes for the milk to pass through. It is rougher than the other parts, that the infant may the more firmly hold it, and of exquisite sense, that the nurse should find pleasure when she gives suck; round about it there is a circle, called *arcola:* in virgins it is pale and knotty; in nurses brown: and in old women black. The veins are two-fold, viz. external and internal: the external arise from the axillary, and are placed under the skin which move the dugs, and are called *thoraciæ*

superiores, the upper breast veins; these in women with child and such as give suck, are often seen very blue. The internal arise or descend from the trunk of the axillary vein, or ramus subclavius; and are called *mammaræ venæ*, or dug veins, these are met by other ascendant veins from the womb, and therefore, the child being born, the blood is carried no longer to the womb, but to the breast; and hence it is that the women which give suck seldom have their courses. How milk is generated and made, the opinions of men are various; some think it to be made of the venal blood, but they are absolutely deceived; some think it to be made only of arterial blood, and these also err from the truth; others say it is made of blood and chyle: but our opinion is that it proceeds from, and is generated off, the chylous juice and a serious part of the arterial blood; for that the ferocity of the arterial blood (and not the substance of the blood itself,) does help to generate and constitute the milk, we are induced to believe, and not only from the foregoing reason, but because no anastamoses of the arteries with the lacteal pipes of the dugs could ever yet be found out; and truly this opinion Bartholine seems to favour, where he saith that all the blood which is poured out of the arteries into the breast is not turned into milk, but only the more serous or wheyish part thereof; the rest, (that which serves for nourishment excepted,) running back again by the veins into the heart.

The *pleura*, or inner covering of the ribs, is a membrane, white, thin, hard, and resembling the peritonæum, but thicker, and stronger. It arises from the tunicles which cover the intercostal nerves proceeding from the back-bone, by means of which it is continued with the coats in the brain: and therefore it is thicker in the back, to whose vertebræ it cleaves as it were inseparably. It is every where double, that the vesseis may be carried within the foldings thereof; the inner part, looking towards the lungs and in-

wards is thickest, smoothest, and as it were bedewed with a waterish humour, that it should not hurt the lungs by any roughness: the outer part is thinner and rougher, that it might cleave the more firmly to the ribs: between these the matter of the pleurisy is many times collected, and not only between the pleura and muscles. As to its figure, it is arched without, hollow within; above it is narrower, below broader, principally towards the sides. From it arise some nervous fibres, by which the lungs are tied to it; if these be too straight, the motion of the lungs is hindered, which causes an incurable difficulty of breathing. Its uses are to cover the whole cavity of the thorax, and render it smooth, that the lungs might not be hurt; and to wrap in all the vital parts, and to defend them from all external injuries. The *mediastinum* is a membrane standing in the middle of the breast, dividing the right side from the left. It arises from the pleura, being a double membrane. Its substance is membraneous, yet softer than the pleura; its exterior part is rougher, because of the fibres by which it is knit to the pleura; but its inner side, towards the lungs is smooth: and about the vessels it is commonly full of fat like the caul. The uses of the mediastinum are, first, to divide the thorax into two parts, that, the breast and lungs being hurt or wounded on the one side, the other might be safe; secondly, to hold up the pericardium firmly, wherein the heart is contained, that it should not rest upon the back-bone, when we lie upon our back; or that it should not fall upon the breast-bone, when we bend ourselves towards the ground; nor touch the ribs when we lie upon our sides: thirdly, to give a safe passage to the vessels which run through it, as also to sustain the midriff, lest it should by the weight of the bowels, be drawn too much downwards.

The *pericardium*, or *cystis* of the heart, is a membrane encompassing the whole heart, whose pyramidal figure it hath. It is so far distant from the

heart as is sufficient to give any way for the motion of the same, and to contain the waterish humour. It has two membranes, the one exterior from the mediastinum; tied before and behind to the *pleura*, and is fibrous; and one interior, from the external tunicles of the vessels of the heart; for within the pericardium, the vessels want their common tunicle, it having been spent upon the pericardium. The original therefore of the pericardium is at the basis from the tunicles which compass the vessels of the heart, which proceed from the pleura. It is connected circularly to the mediastinum, and the neighbouring parts, with many fibres; but especially to the nervous circle of the diaphragma, to which it cleaves so exceeding fast, that it cannot be separated from it without rending, whereby the motion of the heart is directed. Within this pericardium, (besides the heart,) is contained a serous or watery humour, transparently clear, and in some like water wherein flesh has been washed: in taste it is neither sharp, salt, nor acid. It proceeds out of the vessels of the heart, being a watery part of the blood, or lympha, and other juices, which go to their proper receptacles. The use of the juice is to cool and moisten the heart, and to make it slippery, thereby to facilitate its motion: also that the heart, by swimming therein, may be less ponderous, and not strike against any part. Those who have this humour consumed, have their hearts dry: if it be in too great a quantity, it causes a palpitation of the heart, and suffocation, and death follows therefrom; if it be quite consumed a consumption of the body happens.

The heart is a muscular body, included in the pericardium, and situated nearly in the middle of the breast between the lobes of the lungs; being the primary organ of the circulation of the blood, and consequently of life. Its figure is nearly conic, the larger end being called its base, and the smaller end its apex. Its lower part is plain, and the upper part

convex. Its situation is nearly transverse or horizontal; so that its base is in the left side of the thorax: and consequently it is there that the pulsation is felt. The plain surface of the heart lies on the diaphragm; the convex one is turned upwards. The heart is connected, 1st. by the intervention of the pericardium with the mediastinum, and with a large part of the middle of the diaphragm: this is contrived by nature, to prevent its being displaced, inverted, or turned too rudely about, in consequence of the varicus motions of the body. 2nd. Its base is connected to its common vessels: but its apex is free, and is received into a kind of cavity in the left lobe of the lungs. The length of the human heart is about six fingers breadth; its breadth at the base is about five fingers; and its circumference about thirteen. It is both externally and internally surrounded with a small membrane. Tnere is a quantity of fat about it, which covers its base and apex, and serves for lubricating it, and for facilitating its motion. Its blood-vessels are of two kinds, common and proper; its common or peculiar vessels being the coronary arteries and veins. The common vessels of the heart are two veins, called the *vena cava*, and the *vena pulmonalis;* and two arteries, the pulmonary one and aorta. The nerves of the heart are small, and arise from the par-vagum and intercostals: the auricles are two. There are also two cavities in the heart, called its ventricles; of these the right is thinner and weaker in its circumference, but usually much more capacious, than the left: it receives the blood from the vena cava and the right auricle, and delivers it into the pulmonary artery, to be carried to the lungs. The left ventricle is much stronger and thicker in its sides; but it is narrower and smaller than the right; it receives the blood from the pulmonary vein, and the left auricle, and extrudes it very forcibly into the aorta. The right ventricle is in the anterior part of the thorax, so that

they might be called the anterior and posterior ventricles, much more proper than the right or left. There are in the sides of both the ventricles of the heart and of both its auricles, several *columnæ carneæ*, or *lacertuli*, with furrows between them, seeming so many small and distinct muscles; and from the concourse of the tendinous fibres of these in the heart, there are formed peculiar membranes situated at the orifices of the auricles of the heart: and there are also other columns of this kind, which run transversely from one side of the ventricles to the other: these serve partly to assist the contraction of the heart in its systol, and partly to prevent its too great dilation in its diastole. The *valculæ* of the heart are of three kinds, 1. The *tricaspidales;* these are three in number, and are situated at the ingress of the vena cava in the right ventricle. 2. The *mitrales;* these are two, and are situated in the left ventricle at the ingress of the pulmonary vein: these serve to hinder the ingress of the blood from the heart into the veins again, while they are constricted. 3. The *semilunar* ones; these are three, and are situated at the organ of the aorta and pulmonary artery, and serve to prevent the reflux of the blood from them into the heart: these for the sake of strength, are furnished with a number of fleshy fibres and spheroidle corpuscles. The orifices of the veins of Thebesius and Verbeyen, in the hollows of the heart, and for carrying back the blood from the substance of the heart to its cavities. The fibres of the heart are of a muscular substance, and of a most amazing fabric. They are of two kinds, 1. straight ones in the left ventricles; and 2. spiral ones, common to both ventricles, and of two orders. The exterior ones run to the left, from the base of the heart: the interior ones run to the right, and intersect the others; and, when they act, they closely constringe the cavities of the heart, and drive out the blood from them. According to the fabric, the heart may be resolved into two muscles,

each of which constitutes one of its ventricles. The use of the heart is for the circulation of the blood: it receives the blood from the veins, running from all parts of the body; and propels it again by its own motion, to all those parts, through the arteries. On this depends life itself, the preservation of the frame, and the motions and actions of all its parts. But, that the reader may have as distinct an idea as possible of this primary organ of life, we shall lay before him several views of it in the plate annexed; where No. 1. represents the human heart seen in its convex part, and in its natural situation; B marks the branches of the coronary vein; C, the coronary artery; D, the right auricle; E, branches of veins going from the right auricle; G, the trunk of the aorta; H, the trunk or pulmonary artery; I, the ascending trunk of the vena cava, K, L, &c, branches of the aorta, rising upwards; M, one of the branches of the pulmonary artery; N, N, &c. branches of the pulmonary vein. No. 2. represents the heart opened, to show the structure and form of its ventricles; where A expresses the muscular septum, or partition, which divides the ventricles; B, the right ventricle opening into the right auricle, and into the trunk of the pulmonary artery; C, the left ventricle, opening into the left auricle, and into the great trunk of the aorta. No. 3, and No. 4, represent the heart in different positions: where A marks the ascending trunk of the vena cava; B, the trunk of the aorta; C, branches of the pulmonary vein; D, the descending trunk of the vena cava; and E, part of the right auricle, cut away, to shew the different arrangement of the internal fibres and venus ducts.

The lungs, or lights, are the instruments of breathing, and are the largest viscus of the thorax: they are situated in the two sides of it, with the heart, as it were, between them; and are connected, by means of the mediastinum, with the sternum and verbetræ with the heart, by means of the pulmonary vessels,

and immediately with the asperia arteria. The colour of the lungs, in infants, is a fine florid red; in adults, it is darker, and in old people, livid, or varigated with black and white. When inflated, they have some resemblance to the hoof of an ox; and are convex on the upper side, and concave underneath. They are divided into two large lobes, the right and left; the left, which is the smaller, is divided again into two; and the right, which is larger, into three small ones. The membrane with which the lungs are surrounded is continuous with the pleura. The substance of the lungs is spongious, or vesiculous, and they seem, indeed, entirely composed of a number of small vesicles of a fleshy texture, and of a variety of vessels. The vessels of the lungs are the *bronchia*, the *bronchial* artery and vein, the nerves, and the lymphatics. The uses of the lungs are 1. to perform the office of respiration, by which the blood is attenuated in the plexus of the arteries called the *rete vasculosum*. 2. To be assistant to the voice in speaking, and to the sense in smelling. They are also emunctories of the blood, and are of many other important services. The principal diseases to which the lungs are subject, are the asthma, consumption, peripneumony, &c.

OF THE GENERATION AND CIRCULATION OF THE BLOOD.

THE origin of the body is in the chyle, which passing the lacteals, is delivered into the subclavian; where mixing with the blood, they proceed together to the right ventricle of the heart; and there, being yet more intimately mixed, they circulate together through the whole body; till, after several circulations, and secretions at the several strainers of the body, they are assimilated so as to make one uniform compound mass, which appears to be nothing else but chyle altered by the artifice of nature, and exalted into blood; there being no appearance of any thing extraneous mixed with the liquor circulat-

ing in the blood vessels, but chyle, excepting what had been before separated from it for some particular phrposes, which being once served, it is returned to it again: unless, perhaps, it may receive some portion of air in the lungs.

The blood, while in its vessels, appears to the naked eye uniform and homogenus; but, when let out and cold, it separates spontaneously into two different parts, the one red and fibrous, which coheres into a mass, and is called the *cruor*; the other thin and transparent, which retains fluidity when cold, and being supposed specifically heavier than the other, sustains and bears it up, and is called the *serum*. If the red part of the blood bears too great a proportion to the serum, which is the case of athletic persons, and others who do not take a sufficient quantity of drink with their meat, the fault may be corrected by lessening the meat, or by increasing their drink. In the beginning of fevers, the proportion of the red part of the blood to the serum is greater, and at the end of them less, than it is in health. The change of this proportion is owing to persons under this disorder living wholly on drink and liquid nourishment: and bodies loaded with serous moisture, being an argument of too small a proportion of the red part of the blood to the serum, having been freed from their load by abstaining wholly from drink. There are other causes besides the bare quantities of meat and drink, which vary the proportion of the red part of the blood to the serum; for this proportion is greater in country people than in citizens, in persons who use exercise than in persons who are inactive, and in persons who live on flesh meats and fermented liquors, than in persons who live upon vegetables and water. In short, this proportion is increased by things which dry the body and strengthen the fibres, and lessened by things of a contrary nature. Too great a proportion of the red part of the blood to the serum renders bodies subject to inflammatory fevers

on taking cold. The blood is found to consist chiefly of phlegm as the basis or vehicle; for from the best experiments it appears, that in seven ounces of human blood there are five ounces two drachms of phlegm, three drachms of a subtile spirituous oil, a small quantity of a thicker oil, two drachms of salt, and about two of earth. From these constituent parts of the blood, variously combined and distributed by the circulatory motion impressed by the heart, and by the oscillary expansive motion of the interspersed air, and the re-action of the contractile vessels, flow all the properties and operation of the blood. From the mixture of elements, and their lax composition, it becomes susceptible of various alterations and impressions; the principal whereof is coagulation, which usually attends it out of the body, sometimes in it, and scarcely ever without an artificial procurement, but always mortal; and dissolution, which is just opposite to the former, and consists in such a communition of the fibrous part of the blood as indisposes it for the separation of the cruor from the serum. This is frequently the consequence of malignant and pestilential fevers, &c. and is likewise occasioned by some kinds of poisons.

The circulation of the vital blood is performed through the arteries: and its course is from the heart towards the extremes of the body: and this from every part of the body, internal and external; still out of a wider part into a narrower, out of the trunk into the branches. And it is on this principal alone, that all the blood may be derived into an artery, and evacuated at it. For it is evident that all the arteries of the body are continually bringing the blood from the left part of the heart, through the trunks of the arteries, into the branches; and on the contrary that all the veins, excepting the porta, are perpetually bringing back the blood from the extreme parts into the heart. The blood being arrived here, its motion or circulation, is continued as follows. The

auricles of the heart, being large hollow muscles, are furnished with a double series of strong fibres proceeding with a contrary direction to two opposite tendons, the one adhering to the right ventricle, the other to the sinos venosus: as also with innumerable veins and arteries; by the contractile force of these auricles the blood is vigorously expressed, and driven into the right ventricle; which upon this contraction is rendered flaccid, empty, and disposed to admit it. If now the right ventricle, thus full of blood by the contraction of its fibres presses the blood towards the aperture again, venous blood, at the same time pouring in, will drive it back again into the cavity and mix it more intimately; till rising up against the parietes, it raises the valvulæ tricuspides, which are so connected to the fleshy columns extended on the opposite side, as that when laid quite down they cannot close, the parietes of the right ventricle, thence it thrusts towards the right auricle, till being there joined, they stop the passage very closely and prevent any return. By the same means the same blood rises up into three semilunar valves, placed in the extremity of the other mouth, and lying open to the pulmonary artery: these it shuts close against the sides of the artery; and leaves a passage into the artery alone. The venous blood, therefore, that is the blood of the whole body, continually moves out of the *sinus* or trunk of the *vena cava*, through the right auricle and right ventricle, into the pulmonary artery, in a continued and forcible stream. The blood carried by this artery into the lungs, and distributed by its branches through the whole substance thereof, is first admitted into the extremities of the pulmonary vein; called *arteria venosa*; whence passing into four large vessels, which unite together, it is brought to the left *sinus venosus*, or trunk of the pulmonary vein; by the force of whose muscular structure it is driven into the left ventricle, which on this occasion is relaxed, and by that means prepared to receive it.

Hence, as before, it is driven into the left ventricle, which is relaxed by the same means; and the *valvulæ mitrales*, opening, admit into the left ventricle, and hinder its reflux into the pulmonary vein. From hence it is forced into the aorta; at whose orifice there are three similunar valves, which also prevent a reflux by closing the same. And thus is circulation effected: and all the blood sent into the lungs, and received in the *arteria venosa*, *sinus venosus*, left auricle and ventricle, being here continually propelled into the *aorta*, whose ramifications are spread throughout all the rest of the body, with a violent motion. Thus is all the blood, in its return from every part of the body, internal and external, and from every part of the heart and its auricles, impelled into the right ventricle: out of that into the lungs; thence into the left ventricle, and thence through the whole extent of the body; and thence again brought back again to the heart.

In a *fœtus*, the apparatus, for the circulation is somewhat different from that above described. The *septum*, which separates the two auricles of the heart is pierced through with an aperture, called the *foramen ovale*; and the trunk of the pulmonary artery, a little after it has left the heart, sends out a tube in the descending aorta, called the communicating canal. The blood in the lungs of the *fœtus* has none of the advantages of air or respiration; which yet being necessary, nature, it is supposed, takes care that it receives a portion of air, mixed together with its mother's blood, and transmitted to it by the umbilical vessels, to be diffused through the body. This is confirmed hence; that by constringing the naval-string very tight, the child dies like a man strangled; which appears to be owing to nothing but the want of air. And to this, that, as soon as the mother ceases to respire, the *fœtus expires*.

As to the velocity of the circulating blood, and the time wherein the circulation is completed, several

computations have been made. By Dr. Keill's account, the blood is driven out of the heart into the *aorta*, with a velocity which would carry it fifty-two feet in a minute; but this velocity is continually abated in the progress of the blood through the numerous sections or branches of the arteries; so that before it arrives at the extremities of the body its motion is infinitely diminished. The space of time wherein the whole mass of blood may ordinarly circulate, is variously determined. Some of the latest writers state it thus; suppposing the heart to make two hundred pulses in an hour, and that at every pulse there is expelled an ounce of blood: as the whole mass is not ordinarily computed to exceed twenty four pounds, it must be circulated seven or eight times over in the space of an hour. The *impetus*, occasioning the circulation, is great enough in some animals to raise the blood six, seven, or eight feet high from the orifice it spins out at; which however, is far exceeded by that of the sap of a vine in bleeding time, which will sometimes rise upwards of forty feet high. The heat and motion of the blood are always greater, from a greater activity in the soul, in the day than in the night: and they are likewise ever greater from the food taken in the daytime: for the pulse is always quicker after eating than before it; after a full meal than after a spare one; and after a meal of drier and stronger food than after a meal of food that is moister and weaker.

OF THE PULSES.

THE *pulse* is that reciprocal motion of the heart and arteries whereby the warm blood, thrown out of the left ventricle of the heart is so impelled into the arteries, and so distributed throughout the whole body, as to be perceived by the finger. It is certain, that life, health, and the due order of the whole body, depend upon the proper and equable circulation of

the blood and humours through the solid parts; so that, the better regulated and the more equable the circulation is, the more perfectly nature preserves herself, and cures the diseases incident to her; and on the contrary the more this circulation recedes from a due and equable state, the weaker nature is found to be, and the more subject to misfortunes and diseases. Now every one must own, that the circulation of the blood cannot be better investigated than by feeling the pulse, not in a superficial manner, but for a sufficient time, for the pulse not only discovers the imperfection and strength of the whole body, but also the nature of the blood and the state of the various secretions. And, as a pendulum of a clock, by its equable and regular vibrations, manifests the worth of the clock, so the pulse discovers the habit of the patient, and the vigour or deprivations of all the functions.

A moderate, constant, and equal pulse, is the rule and measure by which we are to judge of the rest. A moderate pulse is that which is large, but neither quick nor slow, hard nor unequal; this is the pulse with which all others ought to be compared, and which denotes the best state of health, the absence of all preternatural and foreign things, and a due and temperate degree of heat: for, when such a pulse is present, the fluids are duly spiritous, the fibres possessed of their natural tone, the blood temperate and fluid, and consequently the transpiration free, the nutrition good, and animal functions vigorous, the secretions duly carried on, and the patient in a state of good health. But when the pulse is quicker, and consequently more frequent than usual, it indicates a preternatural irritation of the heart, as the ancients express it, unless it proceeds from external causes. But, if such a pulse continues long, it infalliably denotes a disorder accompanied with an increase, and even a fever. It is generally produced by the intestine motion of the blood, and a change induced on the crasis of the spirits, by

an admixture heterogenus and often caustic particles. When the pulse is vehement, and at the same time quick, it indicates a feverish temperature, an admixture of something heterogenus with the blood, lymph, and spirits: but at the same time a large quantity of health and spirit. If a vehement and quick pulse is also large, the circulation of the blood is brisk, the heat and thirst great, and the whole habit red and turgid. Where the pulse is small, and little blood is conveyed from the heart to the arteries, and from the veins to the heart, the circulation of the blood is faint and languid. Hence the transpirations and secretions are but small, and the strength little; but if a small pulse is at the same time weak, frequent, and thick, it denotes a great languor of the strength, a preternatural intestine motion, and a weak circulation of the blood; and if this species of pulse continues long, it indicates malignity and great danger.

A slow pulse, generally denotes a vascidity, thickness, and weak circulation of the blood, together with a languor of the secretions: but, if it is at the same time weak, it is dangerous, and raises a suspicion of a total loss of strength. But a pulse which is slow and large, denotes sufficient remains of strength, tension, and thickness of the fibres of the heart and arteries; and a viscid and tenacious blood. All unequal pulses are very bad, since they denote that there is neither a due influx of the spirits nor a proper and equal mixture of the blood; but particularly such pulses always prognosticate unlucky events, when they are weak. Intermittent pulses are also of a bad kind, or generally accounted the presages of death. But it is not universally so; for an intermittent pulse frequently happens without danger, where for instance the symptoms are of a bad kind, and the patient's strength still entire. Hence this species of a pulse frequently happens in hypochondriac and melancholic patients, where the intestine motion of the blood is diminished by its thickness. But when the pulse is weak, and quick at the

same time, it generally prognosticates death. An hard pulse generally indicates pains, spasms and convulsions, because the fibres of the heart and arteries are spasmodically constricted. The irregular caprizating and discontinued pulses, denote a very bad state of the body, both with respect to the fluid and solid parts.

It is carefully to be observed, that one kind of pulse is not found in all persons; for the pulse depends on the tone of the muscular fibres, on the influx of the spirits, and the nature and temperament of the blood: and, as all these are surprisingly various in human bodies, with respect to age, sex, the season of the year, the climate, the method of life, the sleep, and the passions of the mind, so also the pulses differ from each other according as these circumstances differ. Thus men generally have a large and vehement pulse, and women one of a more slow and weak kind; for the former have stronger fibres and a hotter blood than the latter. For this reason also, the circulation of the blood is brisker in men than in women; and the former do not generate such loads of redundant blood and humours as women, who are generally weaker, and more subject to diseases. Choleric persons, and those of sanguineo-choleric constitutions, have a larger, quicker, and more vehement pulse, than phlegmatic and melancholic persons; for which reason the fluids move more quickly, the excretions are made more expeditiously, and the blood is more fluid, in the former than in the latter; for the blood of the former is impregnated with a larger quantity of oleous and sulpherous parts, which are the source and matrix of heat and spirituous quantity. Thus also, those of a slender habit, who have strong fibres, and large vessels, have a larger and stronger pulse than those who are fat, have lax fibres, and narrow vessels. Hence they are also sounder, more robust, and more capable of enduring fatigue. This is also the reason why those who are naturally thick and fat are more readily sei-

zed with sickness, and destroyed by it, than those of slender habits. In infants and children, the pulse is frequent and soft; whereas in old persons, it is slow and large, whilst in young persons, and those full grown, it is large and vehement: for generally infants and children generate a large quantity of humours (which are necessary to their growth), and collect a great deal of sordes, which is the reason why infants and children are more generally seized with sickness, and more readily die of it, than youths and adults. Old persons have thick blood, but rigid fibres: for which reason their pulse is hard, and makes a forcible impression on the touch; but in infants and children the pulse is soft, on account of the tenderness and laxity of the fibres. The pulse is also changed by the season of the year, the exercise of the body, the aliments, and the affections of the mind. In the middle of the spring, the pulse is large and vehement: at this season also the strength is greatest; for which reason persons are at that time most rarely sick, and recover most easily: in the middle of the summer the pulse is quicker and weaker, because by the intense heat the strength is impaired, while the intestine motion of the fluids is greater than it usually is. In autumn the pulse is slower, softer, and weaker, than at the middle of the summer, those which are cold, to the winter, and such as are temperate to the spring.

Exercise increases the pulse, and consequently the circulation of the blood, whilst an idle and inactive state renders the pulse slow, weak, and languid, and diminishes the circulation of the fluids. Spirituous aliments renders the pulse large, vehement, and frequent. The pulse of such as are asleep slow, small, and languid; but as soon as they awake, it forthwith becomes large, quicker, and stronger; the pulse of those who are angry, is large, vehement, and quick; and that of such as are frightened, frequent, small, and inactive; and of those who are sorrowful, small, languid, and slow; hence the common and ordinary

affections of the body, change the pulse, so that, without duly adverting to these affections, the pulse cannot be certainly understood, nor can it be determined how far it recedes from a natural state in consequence of diseases.

The natural pulse is therefore to be felt and to be observed, not immediately after exercise, bathing, immoderate eating, drinking wine, or other causes which exagitate the heart and spirits; for we are to determine nothing about the pulse till the force of external causes has ceased, and all perturbations of the body are allayed; for the pulse is the most certain sign and criterion for judging of the motion of the heart and blood; but if the pulse alone is observed, without paying a due regard to other circumstances, it may lay a foundation for forming a false judgment; since the pulse may be disturbed by a thousand abstract causes.

All authors, both ancient and modern, agree, that a frequent pulse, in every species of fever, whether continual or intermittent, whether benign or malignant, whether in its beginning or at its height, proves such a fever to be present: hence the quick or frequent pulse is considered as the true essential sign of fevers; but this frequently is either greater or less, and associates itself with the great or vehement, or with the small and weak, according to the diversity of fevers, and the times of the disease. A frequent pulse when weak and small, is scarcely ever good; since it denotes a languid and slow circulation of the blood; but a frequent, large, and vehement pulse, such as is generally observed in the height of continual fevers, denotes a brisk circulation of the blood, and an increased heat of the body. In investigating the cause of a frequent pulse, which is generally preternatural, and accompanies several disorders, we shall follow the accurate Bellini, who accounts for the motion of the heart from the influx of the blood through the coronary arteries, and of the nervous fluid through

the nerves, into the fibres of the heart; whence he concludes, that the muscles of the heart are most frequently moved when the nervous fluid is most frequently conveyed into them, which happens when it is forced into them by a sufficient quantity of blood flowing forcibly into the brain. Now by a frequent contraction of the heart a frequent pulse is produced, which indicates that a proper quantity of blood is conveyed to the brain, and that the brain is forcibly pressed, which will happen, either when the blood stagnates therein, in consequence of an obstruction of its veins, or when the blood contained in these veins cannot flow in other parts, or in the lungs; or when the blood is thrown into a state of effervescence, by which it assumes a tendency to move in every direction with a greater impetus, and by that means presses the brain more powerfully; the muscles of the heart also move more frequently when irritated by any stimulus. If, therefore, the blood is too acid or hot, so as to stimulate the sinuses of the heart, the heart will be more frequently contracted, and the frequency of the pulse will indicate a stimulating quality in the blood.

Since from the pulse we thus form a judgment not only of the circulation and temperature of the blood, but also of the motion of the spirits, and the strength of the patient, so the knowledge of the pulse, and a due attention to it, becomes of singular service, not only in investigating the nature of disorders, and forming a right judgment concerning them, but also in prescribing medicines for their cure. But they must be carefully, not superficially consulted. The physicians of China are far more careful in this respect than those of Europe; for the Chinese often spend a whole hour in feeling the pulse, whilst the English Physicians have hardly patience to feel above two pulsations; a practice highly culpable, since after ten strokes of the artery, an inequality or intermission often occurs which happens when the unequally-mixed blood passes through

the heart. The pulse is also to be felt in both wrists, in the neck, and the temples: since it is certain from experience, that the pulse in the wrists frequently varies, and may be more commodiously felt in one than another. We ought also to advert to the pulses of other parts; thus sometime hypochondriac patients perceive a large pulse under the ribs on the left side, which happens when a quick and viscid blood, exagitated by heats or any other cause, endeavours to procure a quick passage through the pancreas and spleen, but, stopping in their narrow vessels, produces a pulsation, and a kind of pricking pain.

In continual and malignant fevers, a large internal pulsation in the veins of the head generally denotes a subsequent delirium; since it is a sign that the blood there congested circulates slowly, till at last, becoming stagnant, it produces a violent inflammation of the menninges. If a large pulse arises from an excessive ebullition of the blood, so that in fevers the veins of the temples beat, and the face is turgid, without a softness of the præcordia, there is reason to suspect that the disease will be long, and that it will not terminate without a large hæmorrhage from the nose, an hiccough, convulsions, or sciatic pains. The reason of this is, that the redundant blood seeks for an outlet either by the nose or the hæmorrhoidal veins; and, the sooner this happens, the sooner the patient is free from his disorder.

When a pulsation is observed in any part of the body, where at other times it is not felt, we may certainly conclude, that the part is inflamed and disposed to a suppuration, especially when it is accompanied with tumour and pain. An hard pulse is almost an infallible sign in the membranous parts; for this hardness of the pulse, or excessive tension and vibration of the artery, indicates something of a spasmodic nature arising from the consent of the parts, and produced by the inflammation and pain.

The pulse of persons labouring under disorders of the breast, or a palpitation of the heart, is frequent, unequal, and languid; but such a pulse, unless when vehement, is accompanied with no preternatural heat, and happens because the blood does not pass through the sinuses of the heart and lobes of the lungs. In weakness and a disposition of syncopes, the pulse is generally small, rare, and languid; but if the pulse is absolutely imperceptible, the body covered with a cold sweat, and the functions of the mind are not totally destroyed, I have observed that the patient infallibly dies in six hours: and such a situation I have seen produced by corrosive poison. It is to be observed, that about the critical time in fevers, when nature endeavours to throw off the superfluous and peccant matter by stool or sweat, the pulse, though languid, is yet more regular and less frequent, which is a certain sign of recovery. But if the pulse is soft and undulating, it is a sign that a salutary and critical sweat is coming on.

It is also to be observed, that the pulse is changed by medicines. Thus after drastic purgatives, which procure too many stools, the pulse is generally preternaturally quick. After venæ-section, especially in plethoric habits, the pulse becomes quicker, a sign that the circulation of the blood in consequence of its having a larger space, is happily increased, since by this means a suppression of the menses or hæmorrhoids is generally removed. It is certain, not only from the authority of Sydenham, but also from experience, that after the use of chalybeats, the pulse is quicker, the face redder, and the heat greater. Strong sudorifics, composed of volatile oleous substances, greatly increases the pulsation of the heart and arteries; on the contrary, anodynes, opiates, preparations of nitre, precipitating powders, acids and such things as diminish the intestine motion of the blood and fix its sulphur, render the pulse calm and moderate in pains, inflammations, and febrile intemperature.

Some very useful and important rules for the exhibition of medicines are drawn from the state of the pulse: thus purging and vomiting are contra-indicated by a too quick and vehement pulse; for when the blood is in a violent motion and ebullition, the secretions are generally very languid. If the strength is defective, which may be known by the languid state of the pulse, emetics, and purgatives diminish the strength still more: so that the physician ought to consult the pulse before he exhibits them. For when the pulse is strong, and the motion of the blood regular, these artificial evacuations are most beneficial, and succeed best. The same caution is necessary in the exhibition of sudorifics and all analeptics, which convey heat and motion to the blood; for if the pulse is strong and frequent such spirituous substances do more injury than good; they rarify the blood too much, and accelerate its intestine motion; by which means a delirium and other inflammations are frequently brought on. Great circumspection and attention to the pulse are also requisite in the exhibition of narcotics or opiates; for, as these are possessed of a power of stopping the motion of the blood and spirits, and consequently of impairing strength, so that they ought never to be exhibited when the pulse is weak, languid, and small, but are to be avoided like poison.

OF DISEASES IN GENERAL, THEIR PREVENTION AND CURE.

Disease introduced the art of Medicine, which in a primitive sense, communicates the means of preserving the health when present, and of restoring it when lost. If we look back into the origin of the medical art, we shall find its first foundation to be owing to accidental events, and natural instinct. In the early ages, the sick were placed in crossways, and other public places, to receive the advice of such passengers as knew a remedy suitable to their complaints; and, the better to preserve the memory of

every remarkable cure, both the diseases and the remedy were engraved on pillars, that patients in the like cases might resort to them for instruction and relief. Hence an insight into the virtues of herbs and plants, of metals and minerals, was originally acquired.

As to the part in which reason has acted in the improvement of medicine, it seems to have consisted in observing: 1. That diseases attended with particular circumstances, called symptoms, were sometimes cured without the assistance of art, by spontaneous evacuations, as hæmorrhages, diarrhœas, vomitings, or sweats; whence bleeding, purges, and vomits, took their rise. 2. That the patients were often relieved by the breaking out of various tumours, whence arose the application of tropical remedies. And indeed, it is the best method of improving physic, to observe carefully what means nature, unassisted by art, employs to free the constitution from distempers: since many important hints may be thence taken, for the relief of other patients under the like circumstances. He who would advance the healing art, ought to collect a select treasure of practical observations, rest satisfied with a few but well chosen medicines, be thoroughly acquainted with their virtues and efficacy in different constitutions and diseases, despise the cumbersome load of recipes with which their practical writers of an inferior rank abound, reject the so much extolled medicines of the chemists, and attempt the relief of patients by a proper diet and exercise, and such medicines as observation and sound philosophy recommend; for to the improvement of anatomy and natural philosophy is much of the success of physic to be attributed. The knowledge of medicines, or suitable remedies, is also highly necessary in those, who, in order to moderate the impetus in acute disorders, make evacuations, blunt acrimony, dilute too thick fluids, condense those that are too thin, brace up too lax parts, and relax such as are

too much constricted; they also drive the humours to parts where they will be least prejudicial, upon occasion mitigate pain, and in languors use stimulating medicines. Wine, vinegar, barley, nitre, honey, rhubarb, opium, and other simples are found both safe and powerful medicines. Sydenham tells us, that all manner of diseases may be cured by bleeding, purging, with a subsequent opiate, and proper regimen. In chronical diseases mineral waters, salts, diaphoretics, soap, mercury, steel, with a few vegetables, and proper exercise will generally effect the cure. In a word, what is there in the most elaborate preparation, that is worth half the pains taken about it? Mercury, opium, the Peruvian bark, and other simples, with fire and water, are acknowledged as the surest remedies by the ablest masters of the art; and these are found to be more efficacious in that crude state, in which bountiful nature has imparted them to us, than after the most operose and artificial preparation. We can despair of nothing while we follow simplicity; but the event of intricate labour is fallacious.

Diseases in this and other countries, often flow from local circumstances; whence they admit of great mitigation, and sometimes of being entirely prevented, particularly if proper and timely means be taken for that purpose. Diseased parents, unwholesome food, confined air, and uncommonly wet, cold, damp, or hot seasons, are the forerunners of various disorders; and as these are generally foreseen and known, it should be the duty of every individual to guard against them.

Men are also exposed to particular diseases from the occupations which they follow. Chemists, founders, glass-makers, and several other artists, are hurt by the unwholesome air which they are obliged to breathe. This air is not only loaded with the noxious exhalations arising from metals and minerals, but is so charged with phlogiston as to be rendered

unfit for expanding the lungs sufficiently, and answering the other important purposes of respiration. Hence proceed asthmas, coughs, and consumptions of the lungs, so incident to persons who follow these employments. Such artists ought never to continue too long at work; and when they give over they should suffer themselves to cool gradually. They ought never to drink large quantities of cold, weak, or watery liquors, while the body is hot, nor to indulge in anything that is cold on the stomach.

Miners, and all who work under-ground, are likewise hurt by unwholesome air. The air, by its stagnation in deep mines, not only loses its proper spring and other qualities necessary for respiration, but is often loaded with such noxious exhalations as to become a most deadly poison. Miners are not only hurt by unwholesome air, but likewise by the particles of metal which adhere to their skin, clothes, &c. These are absorbed, or taken up into the body, and occasion palsies, vertigoes, and other nervous affections, which often prove fatal. Fallopius observes, that those who work in mines of Mercury seldom live above three or four years. Lead, and several other metals, are likewise very pernicious to the health.

All who work in mines or metals ought to wash carefully, and to change their clothes as soon as they give over working. Nothing would tend more to preserve the health of such people than a strict and almost religious regard to cleanliness. Plumbers, painters, gilders, smelters, makers of white lead, and many others who work in metals, are liable to the same diseases as miners, and ought to observe the same directions for avoiding them. Tallow-chandlers, boilers of oil, and all who work in putrid animal substance, are likewise liable to suffer from the unwholesome smell or effluvia of these bodies. They ought to pay the same regard to cleanliness as miners: and when they are troubled with nausea, sickness, or indigestions, they should take a gentle purge.

Those who follow laborious employments are in general the most healthy of mankind; yet the nature of their occupations, and the places where they are carried on, expose them to some particular diseases. Husbandmen, for example, are exposed to all the vicissitudes of the weather, which, in this country, are often very great and sudden, and occasion colds, coughs, quinsies, rheumatisms, fevers, and other acute disorders. They are likewise forced to work hard, and often carry burdens above their strength, which, by overstraining the vessels, occasions asthmas, ruptures, &c.

Such as bear heavy burdens, as porters, labourers, &c. are obliged to draw the air with much greater force, and also to keep their lungs distended with more violence, than is necessary for common respiration: by this means the tender vessels of the lungs are overstretched, and often burst, insomuch that a spitting of blood or a fever ensues. Hippocrates mentions an instance to this purpose, of a man, who, upon a wager, carried an ass; but was soon after seized with a fever, vomiting of blood, and a rupture. Carrying heavy burdens is generally the effect of mere laziness, which prompts people to do at once what should be done at twice. Sometimes it proceeds from vanity or emulation. Hence it is, that the strongest men are most commonly hurt by heavy burdens, hard labour, or feats of activity. It is rare to find one who boasts of his strength without a rupture, a spitting of blood, or some disease, which he reaps as the fruit of his folly. When the muscles are violently strained, frequent rest is necessary, in order that they may recover their tone: without this, the strength and constitution will soon be worn out, and a premature old age brought on.

Labourers in the hot season are apt to lie down and sleep in the sun. This practice is so dangerous, that they often wake in a burning fever. Those ardent fevers, which prove so fatal about the end of summer

and beginning of autumn, are frequently occasioned by this means. Fevers of a very bad kind are often occasioned among labourers by poor living. When the body is not sufficiently nourished, the humours become vitiated, and the solids weak; from whence the most fatal consequences ensue. Poor living is likewise productive of many of those cutaneous diseases so frequent among the lower class of people. It is remarkable that cattle, when pinched in their food, are generally affected with diseases of the skin, which seldom fail to disappear when they are put upon a good pasture. This shews how much a good state of the humours depends upon a sufficient quantity of proper nourishment. Poverty not only occasions, but aggravates, many of the diseases of the laborious, and makes them miserable indeed. Here the godlike virtue of charity ought always to exert itself. To relieve the industrious poor in distress, is surely the most exalted act of religion and humanity. They alone who are witnesses of those scenes of calamity, can form a notion of what numbers perish in diseases, for want of proper asisstance, and even for want of the necessaries of life.

Soldiers suffer many hardships from the inclemency of seasons, long marches, bad provisions, hunger, watching, unwholesome climates, bad water, &c. These occasion fevers, fluxes, rheumatisms, and other fatal diseases, which generally do greater execution than the sword, especially when campaigns are continued too late in the year. A few weeks of cold rainy weather will often prove more fatal than an engagement. Sailors may also be numbered amongst the laborious. They undergo great hardships from change of climate, the violence of the weather, hard labour, &c. One great source of the diseases of seafaring people is excess. When they get on shore, after having been long at sea, without regard to the climate, or their own constitutions, they plunge headlong into all manner of riot, and even persist till a fever puts an end to their lives. Thus intemperance, and not the

climate, is often the cause why so many of our brave sailors die on foreign coasts. Such people ought not to live too low; but they would find moderation the best defence against fevers, and many other maladies. We have reason to believe, if due attention were paid to the diet, air, clothing, and above all things to the cleanliness, of sea-faring people, they would be the most healthy set of men in the world; but, when these are neglected, the very reverse will happen.

Nothing can be more contrary to the health and nature of man than a sedentary life, yet this class comprehends the far greater part of the species. Almost the whole female world, and in manufacturing countries the major part of the males, may be reckoned sedentary. But, though sedentary employments are necessary, yet there seems to be no reason why any person should be confined for life to these alone. It is constant confinement that ruins the health. A man will not be hurt by sitting five or six hours a-day; but, if he be obliged to sit ten or twelve, in confined air, he will soon become injured in his health. Unwholesome air is the cause of many disorders. Few are aware of the danger arising from it. People generally pay some attention to what they eat and drink, but seldom regard what goes into the lungs, though the latter often proves more suddenly fatal than the former. A sedentary life seldom fails to occasion an universal relaxation of the solids. This is the great source from whence most of the diseases of sedentary people flow. The scrophula, consumption, hysterics, and nervous diseases, now so common, were very little known in this country before sedentary artificers became so numerous: and they are very little known still among such of our people as follow active employments without doors, though in great towns at least two-thirds of the inhabitants are afflicted with them. Instead of multiplying rules for preserving the health of the sedentary, we shall recommend to them the following plan, viz. That every person who fol-

lows a sedentary employment should cultivate a piec of ground with his own hand. This he might dig, plant sow, and weed, at leisure hours, so as to make it a exercise and amusement, while it produced many o the necessaries of life. After working an hour in garden, a man will return with more keenness to hi employment within doors, than if he had been all th while idle. Labouring the ground is every way con ducive to health. It not only gives exercise to ever part of the body, but the very smell of the earth and fresh herbs revives and cheers the spirits, whilst th perpetual prospect of something coming to maturity delights and entertains the mind. We are so formed as to be always pleased with somewhat in prospect however distant or however trivial. Hence the hap piness that men feel in planting, sowing, building, &c These seem to have been the chief employments of th more early ages: and, when kings and conqueror cultivated the ground, there is reason to believe, tha they knew as well wherein true happiness consiste as we do. In a word, exercise without doors, in on shape or another, is absolutely necessary to health Those who neglect it, though they may drag out life can hardly be said to enjoy it. Weak and effeminate they languish for a few years, and soon drop into a untimely grave.

Every disease may be considered as an assemblag of symptoms, and must be distinguished by those tha are most obvious and permanent; for, by a due atten tion to them, the investigation of diseases in genera will be found a much less difficult matter than peopl are ready to imagine. A proper attention to the pa tient's age, sex, temper of mind, constitution, and man ner of life, will likewise greatly assist, both in the in vestigation and treatment of diseases. In childhoo the fibres are lax and soft, the nerves extremely irrit able, and the fluids thin; whereas in old age the fibre are rigid, the nerves become almost insensible, an many of the vessels imperviable. These and othe

peculiarities render the disease of the young and aged very different, and of course they must require a different method of treatment. Females are liable to many diseases which do not afflict the other sex: besides, the nervous system being more irritable to them than in men, their diseases require to be treated with greater caution. They are less able to bear large evacuations; and all stimulating medicines ought to be administered to them with a sparing hand. The temper of mind ought to be carefully attended to in all diseases. Fear, anxiety, and a fretful temper, both occasion and aggravate diseases. In vain do we apply medicines to the body to remove maladies which proceed from the mind. When that is affected, the best medicine is to sooth the passions, to divert the mind from anxious thought, and to keep the patient as easy and cheerful as possible. Few things are of greater importance, in the cure of diseases, than cleanliness. When a patient is suffered to lie in dirty clothes, whatever perspires from his body is again resorbed, or taken up into it, which serves to nourish the disease, and increase the danger. Many diseases many be cured by cleanliness alone; most of them may be mitigated by it, and in all of them it is highly necessary both for the patient and those who attend them.

OF FEVERS.

FEVERS are not only the most frequent of all diseases, but they are likewise the most complex: in the most simple species of fever there is always a combination of several different symptoms. The distinguishing symptoms of fever are, increased heat, frequency of pulse, loss of appetite, general debility, pain in the head, and a difficulty in performing some of the vital and animal functions. The other symptoms usually attendant on fevers are, nausea, thirst, anxiety, delirium, weariness, wasting of the flesh, want of sleep, or the sleep disturbed and not refreshing. As a fever is only an effort of Nature to free herself from an of-

fending cause, it is the business of those who have the care of the sick, to observe with diligence which way Nature points, and to endeavour to assist her operations. Our bodies are so framed, as to have a constant tendency to expel or throw off whatever is injurious to health. This is generally done by urine, sweat, stool, expectoration, vomit, or some other evacuation. There is reason to believe, if the efforts of nature, at the beginning of a fever, were duly attended to and promoted, it would seldom continue long; but, when her attempts are either neglected or counteracted, it is no wonder if the disease proves fatal. There are daily instances of persons, who, after catching cold, have all the symptoms of a beginning fever; but, by keeping warm, drinking diluting liquors, bathing the feet in warm water, &c. the symptoms in a few hours disappear, and the danger is prevented. When fevers of a putrid kind threaten, the best method of obviating their effects is by repeated vomits. Almost every person in a fever complains of great thirst, and calls out for drink, especially of a cooling nature. This at once points out the use of water and other cooling liquors. What is so likely to abate the heat, attenuate the humours, remove spasms and obstructions, promote perspiration, increase the quantity of urine, and in short, produce every salutary effect in an ardent or inflammatory fever, as drinking plentifully of water, thin gruel, or any other weak liquor of which water is the basis? The necessity of diluted liquors is pointed out by the dry tongue, the parched skin, and the burning heat, as well as by the unquenchable thirst, of the patient. Many cooling liquors which are extremely grateful to patients in a fever, may be prepared from fruits, as decoctions of tamarinds, apple-tea, orange-whey, and the like. Mucilaginous liquors might also be prepared from marshmallow-roots, linseed, lime-tree buds, and other mild vegetables, particularly pointed out in the Herbal. These liquors, especially when acidulated, are highly agreeable to the

patient, and should never be denied him. In fevers, the mind as well as the body should be kept easy. Company is seldom agreeable to one that is sick. Indeed every thing that disturbs the imagination increases the disease; for which reason every person in a fever ought to be kept perfectly quiet, and neither allowed to see or hear any thing that may in the least affect or discompose his mind. What food the patient takes should be in small quantity, light, and of easy digestion. It ought to be chiefly of the vegetable kind, as panada, roasted apples, gruels, and such like. The fresh air should likewise be taken as much as possible; it not only removes his anxiety, but cools the blood, revives the spirits, and proves every way beneficial. Among common people, the very name of a fever generally suggests the necessity of bleeding. This notion seems to have taken its rise from most fevers in this country having been formerly of an inflammatory nature; but true inflammatory fevers are now seldom to be met with. Sedentary occupations, and a different manner of living, have so changed the state of diseases in Britain, that there is now hardly one fever in ten where the lancet is necessary. In most low, nervous, and putrid, fevers, which are now so common, bleeding is really hurtful, as it weakens the patient, sinks his spirits, &c. We would recommend this general rule, never to bleed at the beginning of a fever, unless there be evident signs of inflammation. Bleeding is an excellent medicine when necessary, but should never be wantonly performed. It is likewise a common notion, that sweating is always necessary in the beginning of a fever. When the fever proceeds from an obstructed perspiration, this notion is not ill-founded. If the patient only lies in bed, bathes his feet and legs in warm water, and drinks freely of water-gruel, or any other weak diluting liquor, he will seldom fail to perspire freely. The warmth of the bed, and the diluting drink, will relax the universal spasm, which generally affects the skin at the beginning of

a fever; it will open the pores, and promote the perspiration, by means of which the fever may often be carried off. But, instead of this, the common practice is to heap clothes upon the patient, and to give him things of a hot nature, as spirits, spiceries, &c. which fire his blood, increase the spasms, and render the disease more dangerous. In all fevers a proper attention should be paid to a patient's longings. These are the calls of Nature, and often point out what may be of real use. Patients are not indeed to be indulged in every thing that the sickly appetite may crave; but it is generally right to let them have a little of what they eagerly desire, though it may not seem altogether proper. What the patient longs for, his stomach will generally digest; and such things have sometimes a very happy effect.

OF INTERMITTENT FEVERS, OR AGUES.

THE several kinds of intermittent fevers, or agues, take their names from the period in which the fit returns, as quotidian, tertian, quartan, &c. They are generally occasioned by effluvia from putrid stagnated water. This is evident from their abounding in rainy seasons, and being most frequent in countries where the soil is marshy, as in Holland, the Fens of Cambridgeshire, and Huntingdonshire, the Hundreds of Essex, &c. This disease may also be occasioned by eating too much stone-fruit, by a poor watery diet, damp houses, evening dews, lying upon the damp ground, watching, fatigue, depressing passions, and the like. When the inhabitants of a high country retire to a low one, they are apt to prove fatal. In a word, whatever relaxes the solids, diminishes the perspiration, or obstructs the circulation in the capillary or small vessels, disposes the body to agues.

CURE.—As the chief intentions of cure in an ague are to brace the solids, and promote perspiration, the patient ought to take as much exercise between the fits as he can bear. If he be able to go abroad, rid-

ing on horseback, or in a carriage, will be of great service. But, if he cannot bear that kind of exercise, he ought to take such as his strength will permit. Nothing tends more to prolong an intermitting fever, than indulging a lazy indolent disposition. In this disease, the stomach is generally loaded with cold, viscid phlegm, and frequently great quantities of bile are discharged by vomit; which plainly points out the necessity of such evacuations. Vomits are therefore to be administered before the patient takes any other medicine. But, if the patient be afraid to take a vomit, he ought to cleanse the bowels by a dose or two of Glauber's salt, jalap, or rhubarb: after this two ounces of the best Peruvian bark, finely powdered, may be divided into twenty-four doses. These may either be made into bolusses, as they are used, with a little syrup of lemon, or mixed in a glass of red wine, a cup of camomile-tea, water-gruel, or any other drink that is more agreeable to the patient. In an ague which returns every day, one of the above doses may be taken every two hours during the interval of the fits. In a tertian, or third-day ague, it will be sufficient to take a dose every third hour during the interval; and in a quartan, every fourth. If the patient cannot take so large a dose of the bark, he may divide each of the powders into two parts, and take one every hour, &c. For a young person, a smaller quantity of this medicine will be sufficient, and the dose must be adabted to the age, constitution, and violence of the symptoms. The above quantity of bark will frequently cure an ague; the patient however, ought not to leave off taking the medicine as soon as the paroxysms are stopped, but should continue to use it till there is reason to believe the disease is entirely overcome. Most of the failures in the cure of this disease are owing to patients not continuing to use the medicine long enough. They are generally directed to take it till the fits are stopped, then to leave it off, and begin again at some distance

of time; by which means the disease gathers strength, and often returns with as much violence as before. A relaps may always be prevented and the cure greatly facillitated, by using the following infusion for some time as a drink: Take an ounce of gentian root: of calamus aromaticus, and orange-peel, each half an ounce, with three or four handfuls of camomile flowers, and a handful of coriander seed, all bruised together in a mortar: put half a handful of these ingredients into a tea-pot, and pour thereon a pint of boiling water. A large tea-cup full of this infusion should be drunk three or four times a day; by which means a smaller quantity of bark than is generally used will be sufficient to cure an ague. There is no doubt but many of our own plants or barks, which are very bitter and astringent, would succeed in the cure of intermittent fevers, especially when assisted by aromatics; and it is only by the use of sundry of those herbs recommended in the Herbal as antidotes against agues, that many old women in country places so effectually cure the ague, after it has baffled every exertion of the doctor. In obstinate agues, when the patient is old, the habit phlegmatic, the season rainy, the situation damp, or the like, it will be necessary to add to the above two ounces of the bark, half an ounce of Virginian snake-root, and a quarter of an ounce of ginger, or some other warm aromatic; or, if the symptoms be of an inflammatory nature, half an ounce of salt of wormwood or salt of tartar may be added to the above quantity of bark. As autumnal and winter agues generally prove much more obstinate than those which attack the patient in spring or summer, it will be necessary to continue the use of the foregoing medicines longer in the former than in the latter. If agues are not properly cured, they often degenerate into obstinate chronical disease, as the dropsy, jaundice, &c. For this reason all possible care should be taken to have them radically cured, before the humours be vitiated, and the constitution spoiled.

To prevent agues, endeavour to avoid their causes, The following preventive medicine may however be of use to such as are obliged to live in low marshy countries, or who are liable to frequent attacks of this disease:—Take an ounce of the best Peruvian bark; Virginian snake-root, and orange-peel, of each half an ounce: bruise them all together, and infuse for five or six days in a bottle of brandy, Holland gin, or wine; afterwards pour off the clear liquor, and take a wine-glass of it twice or thrice a-day. Those who can bring themselves to chew the bark will find that method succeed very well. Gentian-root, or calamus-aromaticus, may also be chewed by turns for the same purpose. All bitter herbs are antidotes to agues, especially that are warm and astringent.

OF AN ACUTE CONTINUAL FEVER.

THIS fever is denominated acute, ardent, or inflammatory. It most commonly attacks the young, or persons about the prime or vigour of life, especially such as live high, abound with blood, and whose fibres are strong and elastic. It seizes people at all seasons of the year; but is most frequent in the spring and beginning of summer. It may be occasioned by any thing that overheats the body, or produces plethora; as violent exercise, sleeping in the sun, drinking strong liquors, eating spiceries, a full diet, with little exercise, &c. It may likewise be occasioned by whatever obstructs the perspiration; as lying on the damp ground, drinking cold liquor when the body is hot, night-watching, or the like.

CURE.—As this disease is always attended with danger, the best medical assistance ought to be procured as soon as possible; and such medicines should be used as are calculated to dilute the blood, correct the acrimony of the humours, allay the excessive heat, remove the spasmodic stricture of the vessels, and promote the secretions. For this purpose let the patient drink plentifully of diluting liquors; as water-gruel,

or oatmeal-tea, clear whey, barley-water, balm-tea, or apple-tea; which may be sharpened with juice of orange, jelly of currants, raspberries, and such like. If the patient be costive, an ounce of tamarinds, with two ounces of stoned raisins of the sun, and a couple of figs may be boiled in three English pints of water to a quart. This makes a very pleasant drink, and may be used at discretion. The patient's diet must be very spare and light; and it will afford him great relief, especially in a hot season, to have fresh air frequently let into his chamber. This, however, must be done in such a manner as not to endanger his catching cold. It is too common in fevers to load the patient with bed-clothes, under the pretence of making him sweat, or defending him from the cold. This custom has many ill effects. It increases the heat of the body, fatigues the patient, and retards instead of promoting the perspiration. In this and all other fevers, attended with a hard, full, quick pulse, bleeding is of the greatest importance. This operation ought always to be performed as soon as the symptoms of an inflammatory fever appear. The quantity of blood to be taken away must be in proportion to the strength of the patient and the violence of the disease. If after the first bleeding the fever should rise, and the pulse become more frequent and hard, there will be a necessity for repeating it a second, and perhaps a third, or even a fourth time, which may be done at the distance of twelve, eighteen, or twenty-four hours from each other, as the symptoms require. If the pulse continues soft, and the patient is tolerably easy after the first bleeding, it ought not to be repeated. If the heat and fever be very great, forty or fifty drops of the dulcified or sweet spirit of nitre may be made into a draught, with an ounce of rose-water, two ounces of common water, and half an ounce of simple syrup, or a bit of loaf-sugar. This draught may be given to the patient every three or four hours, while the fever is violent; afterwards, once in five or six hours will be sufficient.

If about the tenth, eleventh, or twelfth day, the pulse becomes more soft, the tongue moister, and the urine begins to let fall a reddish settlement, there is reason to expect a favourable issue to the disease. But if, instead of these symptoms, the patient's spirits grow languid, the pulse sinks, and his breathing becomes difficult, with a stupor, trembling of the nerves, startling of the tendons, &c. there is reason to fear that the consequences will prove fatal. In this case blisters must be applied to the head, ancles, inside of the legs or thighs, as there may be occasion; poultices of wheat-bread, mustard, and vinegar, may likewise be applied to the soles of the feet, and the patient must be supported with cordials, as strong white-wine whey, negus, sago-gruel with wine in it, and such like. Should the patient recover, he ought to take some gentle laxative. An ounce of tamarinds and a drachm of senna may be boiled for a few minutes, in a pint of water, and an ounce of manna dissolved in the decoction; afterwards it may be strained, and a tea-cup full drunk every hour till it operates. This dose may be repeated twice or thrice, five or six days intervening betwixt each, and the patient should be kept easy till his strength and spirits are sufficiently recruited.

OF THE PLEURISY.

THE pleurisy is an inflammation of that membrane called the *pleura*, which lines the inside of the breast. It may be occasioned by whatever obstructs the perspiration; as cold northerly winds: drinking cold liquors when the body is hot; sleeping without doors on the damp ground; wet clothes, plunging the body into cold water, or exposing it to the cold air, when covered with sweat,&c. It may likewise be occasioned by drinking strong liquors; by the stoppage of useful evacuations; as old ulcers, issues, sweating of the feet or hands, &c., the sudden striking in of any eruption, as the itch, the measles, or the small-pox. A pleurisy may likewise be occasioned by violent exer-

cise, as running, wrestling, leaping, or by supporting great weights, blows on the breast, &c. The pulse in this disease is commonly quick and hard, the urine high coloured; and if blood be let it is covered with a tough crust, or buffy coat. The patient's spittle is at first thin, afterwards it becomes grosser, and is often streaked with blood.

CURE.—Nature generally endeavours to carry off this disease by a critical discharge of the blood from some part of the body, by expectoration, sweat, loose stools, thick urine, or the like. We ought therefore to second her intentions by lessening the force of the circulation, relaxing the vessels, diluting the humours, and promoting expectoration. Copious bleeding in the beginning of a pleurisy, has a much better effect than repeated small bleedings. A man may lose twelve or fourteen ounces of blood as soon as it is certainly known that he is seized with a pleurisy. For a younger person, or one of a delicate constitution, the quantity must be less. If after the first bleeding, the stitch, with the other violent symptoms, should continue, it will be necessary, at the distance of twelve or eighteen hours, to let eight or nine ounces more. If the symptoms do not then abate, and the blood shows a strong buffy coat, a third, or even a fourth bleeding may be requisite. But this operation is seldom necessary after the third or fourth day of the fever, and ought not then to be performed, unless in the most urgent circumstances. The blood may be attenuated without bleeding; and the pain of the side abated by fomenting, blistering, &c. Fomentations may be made by boiling a handful of the flowers of elder, camomile, and common mallows, or any other soft vegetables recommended for this complaint in the Herbal. The herbs may either be put into a flannel bag, and applied warm to the side, or flannels may be dipped in the decoction, afterwards wrung out, and applied to the part affected, with as much warmth as the patient can easily

bear. Fomentations not only ease the pain, but relax the vessels, and prevent the stagnation of the blood and other humours. Leaves of various plants might likewise be applied to the patient's side with advantage. I have often seen great benefit from young cabbage leaves applied warm to the side in a pleurisy. These not only relax the parts, but likewise draw off a little moisture, and may prevent the necessity of blistering plasters; which, however, when other things fail, must be applied. What is called the crisis or height of the fever, is sometimes attended with very alarming symptoms, as difficulty of breathing, an irregular pulse, covulsive motions, &c. These are apt to frighten the attendants, and induce them to do improper things, as bleeding the patient, giving him strong stimulating medicines, or the like. But they are only the struggles of Nature to overcome the disease, in which she ought to be assisted by plenty of diluting drink, which is then peculiarly necessary. If the patient's strength however be much exhausted by the disease, it will be necessary at this time to support him with small draughts of white-wine whey, negus, or the like. When the pain and fever are gone, it will be proper, after the patient has recovered sufficient strength, to give him some gentle purges. He ought likewise to use a light diet of easy digestion, and his drink should be of a cleansing nature.

The *paraphrenitis*, or inflammation of the diaphragm, is so nearly connected with the pleurisy, and resembles it so much in the manner of treatment, that it is scarcely necessary to consider it as a separate disease. It is attended with a very acute fever, and an extreme pain of the part affected, which is generally augmented by coughing, sneezing, drawing in the breath, taking food, going to stool, making water, &c. Hence the patient breathes quick, and draws in his bowels to prevent the motion of the diaphragm; is restless, anxious, has a dry cough, a

hiccup, and often a delirium. Every method should be taken to prevent a suppuration, as it is impossible to save the patient's life when this happens. The regimen and medicine are in all respects the same as in the pleurisy. We shall only add, that in this disease emollient clysters are peculiarly useful, as they relax the bowels, and by that means make a derivation from the part affected.

OF INFLAMMATION OF THE LUNGS.

THIS disease is generally fatal to those who have a flat breast, or narrow chest, and to such as are afflicted with an asthma, especially in the decline of life. Sometimes the inflammation reaches to one lobe of the lungs only, at other times the whole organ is affected; in which case the disease can hardly fail to prove fatal. An inflammation of the lungs is sometimes a primary disease, and sometimes it is in consequence of other diseases, as a quinsey, a pleurisy, &c. Most of the symptoms of a pleurisy likewise attend an inflammation of the lungs; only in the latter the pulse is more soft, and the pain less acute; but the difficulty of breathing and oppression of the breast, are generally greater.

CURE.—Bleeding and purging are generally proper at the beginning of this disease; but, if the patient's spittle is pretty thick, as well as concocted, neither of them are necessary. It will be sufficient to assist the expectoration by some of the sharp medicines recommended for that purpose in the pleurisy: blisters ought to be applied pretty early. If the patient does not spit, he must be bled according as his strength will permit, and have a gentle purge administered. Afterwards his body may be kept open by clysters, and the expectoration promoted by taking every four hours two table spoonfuls of the solution of gum ammoniac, with oxymel of squills, &c. When an inflammation of the breast does not yield to bleeding blistering, and other evacuations, it commonly

ends in a suppuration, which is more or less dangerous according to the part where it is situated. When this happens in the pleura, it sometimes breaks outwardly, and the matter is discharged from the wound. If the suppuration happens within the substance or body of the lungs, the matter may be discharged by expectoration: but if the matter floats into the cavity of the breast, between the pleura and the lungs, it can only be discharged by an incision made betwixt the ribs. If the patient's strength does not return after the inflammation is to all appearance removed; if his pulse continues quick though soft, his breathing difficult and oppressed; if he has cold shiverings at times, his cheek flushed, his lips dry; and if he complains of thirst, and want of appetite; there is reason to fear a suppuration, and that a consumption of the lungs will ensue: the proper treatment of which we shall next consider.

OF CONSUMPTIONS.

CONSUMPTIONS prevail more in England than in any other part of the world; owing perhaps to the great use of animal food and malt-liquors, the general application to sedentary employments, and the great quantity of pit-coal which is burnt; to which we may add the perpetual changes in the atmosphere, or variableness of the weather. As this disease so frequently proves fatal, we shall point out its causes, in order that people may as much as possible endeavour to guard against it; these are, confined or unwholesome air; violent passions, exertion, or affections of the mind; grief, disapointment, anxiety, or close application to study:—great evacuations; as sweatings, diarrhœas, diabetes, excessive venery, the fluor albus, an overdischarge of the menstrual flux, giving suck too long:—also the sudden stoppage of customary evacuations; as the bleeding piles, sweating of the feet, bleeding at the nose, the menses, issues, ulcers, or eruptions of any kind. Consumptions are likewise

caught by sleeping with the diseased; for which reason this should be carefully avoided; but more consumptive patients date the beginning of their disorders from wet feet, damp beds, night air, wet clothes, or catching cold after the body has been heated, than from all other causes put together. This disease however is sometimes owing to an hereditary taint, or a scrophulous habit: in which case it is generally incurable—yet let none despair.

CURE.—On the first appearance of a consumption, if the patient lives in any place where the air is confined, he ought immediately to quit it, and to make choice of a situation in the country, where the air is pure and free. Here he must not remain inactive, but take every day as much exercise as he can bear. It is a pity those who attend the sick seldom recommend riding in this disease, till the patient is either unable to bear it, or the malady has become incurable: patients are likewise apt to trifle with themselves. They cannot see how one of the common actions of life should prove a remedy in an obstinate disease, and therefore they reject it, while they greedily hunt after relief from medicine, merely because they do not understand it. Next to proper air and exercise, a due attention should be paid to diet, which ought to be calculated to lessen the acrimony of the humours, and to nourish and support the patient. For this purpose he should keep chiefly to the use of vegetables and milk. Milk alone is of more value in this disease than the whole *materia medica*. Asses milk is commonly reckoned preferable to any other; but it cannot always be obtained; besides, it is generally taken in very small quantity; whereas, to produce any effects, it ought to make a considerable part of the patient's food. Some extraordinary cures in consumptive cases have been performed by women's milk; and, could it be obtained in sufficient quantity, we would recommend it in preference to any other. It is better if the patient can suck it from the breast, than to drink it af-

terwards. A man who was reduced to such a degree of weakness in a consumption, as not to be able to turn in bed, sucked his wife's breasts, not with a view to reap any advantage from the milk, but to make her easy. Finding himself however greatly benefited by it, he continued to suck her till he became perfectly well, and is at present a strong and healthy man. Some prefer butter-milk to any other, and it is indeed a very valuable medicine, if the stomach be able to bear it. It does not agree with every person at first: and is therefore often laid aside without a sufficient trial. It should at first be taken sparingly, and the quantity gradually increased, until it comes to be almost the sole food. I never knew it succeed unless where the patient almost lived upon it. Wholesome air, proper exercise, and a diet consistent therewith, is the only course that can be depended on in a beginning consumption. If the patient has strength and sufficient resolution to persist in such a course, he will seldom be disappointed of a cure. In the first stage of a consumption, the cough may sometimes be appeased by bleeding; and the expectoration may be promoted by the following medicines. Take fresh squills, gum-ammoniac, and powdered cardamum-seeds, of each a quarter of a ounce; beat them together in a mortar, and, if the mass proves too hard for pills, a little of any kind of syrup may be added to it. This may be formed into pills of a moderate size, and four or five of them taken twice or thrice a-day, according as the patient's stomach will bear them. A mixture made of equal parts of lemon-juice, fine honey, and syrup of poppies, may likewise be used. Four ounces of each of these may be simmered together in a saucepan, over a gentle fire, and a table-spoonful of it taken at any time when the cough is troublesome. It is common in this stage of the disease to load the patient's stomach with oily and balsamic medicines. These instead of removing the cause of the disease, tend rather to increase it, by heating the blood, while they pall

the appetite, relax the solids, and prove every way hurtful to the patient. Whatever is used for removing the cough, besides riding and other proper regimen, ought to be medicines of a sharp and cleansing nature; as oxymel, syrup of lemons, &c. For the patient's drink we would recommend infusions of the bitter plants mentioned in the Herbal, such as ground-ivy, the smaller centaury, camomile-flowers, water-trefoil, &c. These infusions may be drunk at pleasure. They strengthen the stomach, promote digestion, rectify the blood, and at the same time answer all the purposes of dilutition, and quench thirst much better than things that are luscious or sweet. But, if the patient spits blood, he ought to use, for his ordinary drink, infusions or decoctions of the vulnerary roots, plants, &c. There are many other mucilaginous plants and seeds of a healing and agglutinating nature, recommended in the Herbal, from which decoctions or infusions may be prepared with the same intention; as the orches, the quince-seed, coltsfoot, linseed, sarsaparilla, &c. The conserve of roses is here peculiarly proper. It may either be put into the decoction above described, or eaten by itself. No benefit is to be expected from trifling doses of this medicine. It seldom proves of any service, unless three or four ounces at least are used daily for a considerable time. In this way I have seen it produce very happy effects, and would recommend it wherever there is a discharge of blood from the lungs. When the spitting up of gross matter, oppression of the breast, and the hectic symptoms, show that an imposthume is formed in the lungs, the Peruvian bark is the only drug which has any chance to counteract the general tendency which the humours then have to putrefaction. An ounce of it in powder may be divided into eighteen or twenty doses, of which one may be taken every three hours through the day, in a little syrup, or a cup of horehound tea. We would not recommend the bark while there are any symptoms of an inflammation of the breast; but, when it

is certainly known that matter is collected there, it is one of the best medicines which can be used. Few patients indeed have resolution enough to give the bark a fair trial at this period of the disease, otherwise we have reason to believe that great benefit might be reaped from it.

A NERVOUS CONSUMPTION is a wasting decay of the whole body, without any considerable degree of fever, cough, or difficulty of breathing. It is attended with indigestion, weakness, and want of appetite, &c. Those who are of a fretful temper, who indulge in spirituous liquors, or who breathe an unwholesome air, are most liable to this disease. We would recommend, for the cure of a nervous consumption, a light and nourishing diet, plenty of exercise in a free open air, and the use of such bitters as brace and strengthen the stomach; as the Peruvian bark, gentian root, camomile, horehound, &c. These may be infused in water or wine, and a glass of it drunk frequently. Agreeable amusements, cheerful company, and riding about, are preferable to all medicines in this disease. For which reason, when the patient can afford it, we would recommend a long journey of pleasure, as the most likely means to restore his health. What is called a *symptomatic consumption* cannot be cured without first removing the disease by which it is occasioned. Thus, when a consumption proceeds from the scrophula or king's-evil, from the scurvy, the asthma, the venereal disease, &c., a due attention must be paid to the malady from whence it arises, and the regimen and medicine directed accordingly. When excessive evacuations of any kind occasion a consumption, they must not only be restrained, but the patient's strength must be restored by gentle exercise, nourishing diet, and generous cordials. Young and delicate mothers often fall into consumptions by giving suck too long. As soon as they perceive their strength and appetite begin to fail, they ought immediately to wean the child, or provide another nurse, otherwise they cannot expect a cure.

OF THE SLOW OR NERVOUS FEVER.

NERVOUS FEVERS may be occasioned by whatever depresses the spirits, or impoverishes the blood; as grief, fear, anxiety want of sleep, intense thought, living on poor watery diet, unripe fruits, cucumbers, melons, mushrooms, &c. They may likewise be occasioned by damp, confined, or unwholesome air. Hence they are very common in rainy seasons, and prove most fatal to those who live in dirty, low houses, crowded streets, hospitals, jails, or such like places. Persons whose constitutions have been broken by excessive venery, frequent salivations, too free an use of the purgative medicines, or any other excessive evacuations, are very liable to this disease.

CURE.—The patient must not be kept too low. His strength and spirits ought to be supported by nourishing diet, and cordials. For this purpose his gruel, panada, or whatever food he takes, must be mixed with wine according as the symptoms may require. Pretty strong white wine whey, or small negus, sharpened with the juice of orange or lemon, will be proper for his ordinary drink. Where a nausea, load, and sickness at stomach, prevail at the beginning of a fever, it will be necessary to give the patient a gentle vomit. Fifteen or twenty grains of ipecacuanah in fine powder will generally answer this purpose very well. This may be repeated any time before the third or fourth day, if the above symptoms continue. Vomits not only clean the stomach, but, by the general shock which they give, promote the perspiration, and have many other excellent effects in slow fevers, where there are no signs of inflammation, and nature wants rousing. Such as dare not venture upon a vomit, may clean the bowels by a small dose of Turkey rhubarb, or infusion of senna and manna. In all fevers the great point is to regulate the symptoms, so as to prevent them from going

to either extreme. Thus, in fevers of the inflammatory kind, where the force of the circulation is too great, or the blood dense, and the fibres too rigid, bleeding and other evacuations are necessary. But in nervous fevers, where nature flags, where the blood is vapid and poor, and the solids relaxed, the lancet must be spared, and wine, and other cordials plentifully administered. Though bleeding is generally improper in this disease, yet blistering is highly necessay. Blisters may be applied at all times of the fever with great advantage. If the patient is delirious, he ought to be blistered on the neck or head; and it will be the safest course, while the insensibility continues, as soon as the discharge occasioned by one blister abates, to apply another to some other part of the body, and by that means keep up a continual succession of them till he be out of danger. A miliary eruption sometimes breaks out about the ninth or tenth day. As eruptions are often critical, great care should be taken not to retard Nature's operation in this particular. The eruption ought neither to be checked by bleeding or other evacuations, nor pushed out by a hot regimen: but the patient should be supported by gentle cordials, as wine-whey, small negus, sago-gruel, with a little wine in it, and such like. He ought not to be kept too warm; yet a kindly breathing sweat should by no means be checked. In desperate cases where the hiccup and starting of the tendons have already come on, we have sometimes seen extraordinary effects from large doses of musk frequently repeated. Musk is doubtless an antispasmodic, and may be given to the quantity of a scruple three or four times a day, or oftener if necessary. Sometimes it may be proper to add to the musk a few grains of camphire, and salt of hartshorn, as these tend to promote perspiration and the discharge of urine. Thus fifteen grains of musk, with three grains of camphire, and six grains of salt of hartshorn, may be made iuto a bolus with a little syrrup and

given as above. If the fever should intermit, which it frequently does towards the decline, or if the patient's strength should be wasted with collaquative sweats, &c., it will be necessary to give him the Peruvian bark. Half a drachm, or a whole drachm, if the stomach will bear it, of the bark in fine powder, may be given four or five times a-day, in a glass of red port or claret. Should the bark in substance not sit easy on the stomach, an ounce of it in powder may be infused in a bottle of Lisbon or Rhenish wine, for two or three days: afterwards it may be strained, and a glass of it taken frequently.

OF THE MALIGNANT, PUTRID, OR SPOTTED FEVER.

THIS fever is occasioned by foul air, from a number of people being confined in a narrow place, not properly ventilated; from putrid animal and vegetable effluvia, &c. Hence it prevails in camps, jails, hospitals, and infirmaries, especially where such places are too much crowded, and cleanliness is neglected. Putrid, malignant, or spotted fevers, are highly infectious; and are therefore often communicated by contagion. For which reason all persons ought to keep at a distance from those affected with such diseases, unless their attendance is absolutely necessary. Putrid fevers may be distinguished from the inflammatory by the smallness of the pulse, the great dejection of mind, the dissolved state of the blood, the petechiæ, or purple spots, and the putrid smell of the excrements. They may likewise be distinguished from the low or nervous fever by the heat and thirst being greater, the urine of a higher colour, and the loss of strength, dejection of mind, and all other symptoms, more violent.

CURE.—The duration of putrid fevers is extremely uncertain; sometimes they terminate betwixt the seventh and fourteenth day, and at other times they are prolonged for five or six weeks. Their duration

depends greatly upon the constitution of the patient, and the manner of treating the disease; in which we ought to endeavour, as much as possible, to counteract the putrid tendency of the humours; to support the patient'sstrength and spirits; and to assist nature in expelling the cause of the disease, by gentle promoting perspiration and the other evacuations. Besides the frequent admission of fresh air, which is extremely necessary, we would recommend the use of vinegar, verjuice, juice of lemon, Seville orange, or any kind of vegetable acid that can be most readily obtained. These ought frequently to be sprinkled upon the floor, the bed, and every part of the room. The fresh skins of lemons or oranges ought likewise to be laid in different parts of the room, and they should be frequently held to the patient's nose. The use of acids in this manner would not only prove very refreshing to the patient, but likewise tend to prevent the infection from spreading among those who attend him. Strong-scented herbs, as rue, tansy, rosemary, wormwood, &c. may likewise be laid in different parts of the house, and smelled to by those who go near the patient. If a vomit be given at the beginning of this fever, it will hardly ever fail to have a good effect; but, if the fever has gone on for several days, and the symptoms are violent, vomits are not so safe. The body is always to be kept gently open by clysters, or mild laxative medicines. Bleeding is seldom necessary in putrid fevers. If there be signs of an inflammation, it may sometimes be permitted at the first onset; but the repetition of it generally proves hurtful. Blisters are never to be used unless in the greatest extremities. If the petechiæ or spots should suddenly disappear, the patient's pulse sink remarkably, and a delirium, with other bad symptoms, come on, blistering may be permitted. In this case the blisters are to be applied to the head, and inside of the legs or thighs. But, as they are sometimes apt to occasion a gangrene, we would rather recommend

warm cataplasms or poultices of mustard and vinegar to be applied to the feet, having recourse to blisters only in the utmost extremities. It is common in the beginning of this fever to give the emetic tartar in small doses, repeated every second or third hour, till it shall either vomit, purge, or throw the patient into a sweat. This practice is very proper, provided it be not pushed so far as to weaken the patient. In the most dangerous species of this disease, when it is attended with purple, livid, or black, spots, the Peruvian bark should be administered; it must not only be given in large doses, but be duly persisted in. The best method of administering it is certainly in substance; but, for those who cannot take it in substance, it may be infused in wine. For preventing putrid fevers, we would recommend a strict regard to cleanliness, a dry situation, sufficient exercise in the open air, wholesome food, and a moderate use of generous liquors. Infection ought above all things to be avoided. No constitution is proof against it; and, when a putrid fever seizes any person in a family, the greatest attention is necessary to prevent the disease from spreading. Any one who is apprehensive of having caught the infection, ought immediately to take a vomit, and to work it off by drinking plentifully of camomile-tea. This may be repeated in a day or two, if the apprehension still continue, or any unfavourable symptoms appear.

OF THE MILIARY FEVER,

So called, from the small pustules or bladders which appear on the skin, resembling, in shape and size, the seeds of millet. The pustules are either red or white, and sometimes both are mixed together. It chiefly attacks the idle and phlegmatic, or persons of a relaxed habit. The young and the aged are more liable to it than those in the vigour and prime of life. It is likewise more incident to women than men, especially the delicate and the indolent, who, neglecting exercise

keep continually within doors, and live upon weak watery diet. Such females are extremely liable to be seized with this disease in childbed, and often lose their lives by it. When this is a primary disease, it makes its attacks, like most other eruptive fevers, with a slight shivering, which is succeeded by heat, loss of strength, a low quick pulse, difficulty of breathing, with great anxiety, and oppression of the breast, and in childbed women the milk generally goes away, and the other discharges stop.

CURE.—Sometimes the miliary fever approaches towards a putrid nature, in which case the patient's strength must be supported with generous cordials, joined with acids; and, if the degree of putrescence be great, the Peruvian bark must be administered. If the head be much affected, the body must be kept open by emollient clysters. If the food and drink be properly regulated, there will be little occasion for medicine. Where nature flags, and the eruption comes and goes, it may be necessary to keep up a stimulus, by a continual succession of small blistering plasters; but we would not recommend above one at a time. If however the pulse should sink remarkably, the pustules fall in, and the head be affected, it will be necessary to apply several blisters to the most sensible parts, as the inside of the legs and thighs, &c. Bleeding is seldom necessary in this disease, and sometimes it does much hurt, as it weakens the patient, and depresses his spirits. If the disease proves tedious, or the recovery slow, we would recommend the Peruvian bark, which may either be taken in substance, or infused in wine or water as the patient inclines. To avoid this disease, a pure dry air, sufficient exercise, and wholesome food, are necessary. Pregnant women should guard against costiveness, and take daily as much exercise as they can bear, avoiding all green fruits, and other unwholesome things; and, when in childbed, they ought strictly to observe a cool regimen.

OF THE REMITTING FEVER.

THIS fever takes its name from a remission of the symptoms, which happens sometimes sooner, and sometimes later, but generally before the eighth day. The remission is generally preceded by a gentle sweat, after which the patient seems greatly relieved, but in a few hours the fever returns. These remissions return at very irregular periods, and are sometimes of longer, sometimes of shorter, duration; the nearer however that the fever approaches to a regular intermittent, the danger is the less. They are most frequent in close calm weather, especially after rainy seasons, great innundations, or the like. No age, sex, or constitution, is exempted from the attacks of this fever; but it chiefly seizes persons of a relaxed habit, who live in low dirty habitations, breathe an impure stagnated air, take little exercise, and use unwholesome diet. The first symptoms of this fever are pains and giddiness in the head, with alternate fits of heat and cold. The pulse is sometimes a little hard, but seldom full, and the blood, when let, rarely shows any sign of inflammation. In order to cure this fever, endeavours should be used to bring it to a regular intermission. This intention may be promoted by bleeding, if there be any signs of inflammation; but, when that is not the case, bleeding ought by no means to be attempted, as it will weaken the patient, and prolong the disease. A vomit however will seldom be improper, and is generally of great service. Twenty or thirty grains of ipecacuanha will answer this purpose very well; but, where it can be obtained, we would rather recommend a grain or two of emetic tartar, with five or six grains of ipecacuanha, to be made into a draught and given for a vomit. This may be repeated once or twice at proper intervals, if the sickness or nausea continues. The body ought to be kept open either by clysters or gentle laxatives, as weak

infusions of senna, manna, small doses of the lenitive electuary, cream of tartar, tamarinds, stewed prunes, or the like; but all strong drastic purgatives are to be avoided. By this course the fever in a few days may generally be brought to a pretty regular or distinct intermission, in which case the Peruvian bark may be administered, and it will seldom fail to perfect the cure.

OF THE SMALL-POX.

THE small-pox is commonly caught by infection. Since the disease was first brought from Arabia into Europe, the infection has never been wholly extinguished: nor have any proper methods been taken for that purpose; so that now it has become in a manner constitutional. Children who have over-heated themselves by running, wrestling, &c. or adults after a debauch, are most apt to be seized with the small-pox. The disease is so generally known, that a minute description of it is unnecessary. Children commonly look dull, seem listless and drowsy, for a few days before the more violent symptoms of small-pox appear. They are likewise more inclined to drink than usual, have little appetite for solid food, complain of weariness, and, upon taking exercise, are apt to sweat. These are succeeded by slight fits of cold and heat in turns, which, as the time of the eruption approaches, become more violent, and are accompanied with pains of the head and loins, vomiting, &c. The pulse quick, with a great heat of the skin, and restlessness. When the patient drops asleep, he awakes in a kind of horror, with a sudden start, which is a very common symptom of the approaching eruption; as are also convulsion fits in young children. The most favourable symptoms are a slow eruption, and an abatement of the fever as soon as the pustules appear. In a mild distinct kind of small-pox, the pustules seldom appear before the fourth day from the time of sickening, and they generally keep com-

ing out gradually for several days after. Pustules, which are distinct, with a florid red basis, and which fill with thick purulent matter, first of a whitish, and afterwards of a yellowish, colour, are the best. It is a most unfavourable symptom when petechiæ, or purple, brown, or black spots are interspersed among the pustules. These are signs of a putrid dissolution of the blood, and show the danger to be very great. Bloody stools or urine, with a swelled belly, are bad symptoms; as is also a continual strangury. Pale urine, and a violent throbbing of the arteries of the neck, are signs of an approaching delirium, or of convulsion-fits. When the face does not swell, or falls before the pock comes to maturity, it is very unfavourable. If the the face begins to fall about the eleventh or twelfth day, and at the same time the hands and feet begin to swell, the patient generally does well; but, when these do not succeed each other, there is reason to apprehend danger.

CURE.—All that is necessary during the eruptive fever, is to keep the patient cool and easy, allowing him to drink freely of some weak diluting liquor, as balm-tea, barley-water, clear whey, gruels, &c. Much mischief is done at this period by confining the patient to his bed, and plying him with warm cordials or sudorific medicines. Every thing that heats and inflames the blood increases the fever, and pushes out the pustules prematurely. This has numberless ill effects. It not only increases the number of pustules, but tends likewise to make them run into one another; and, when they have been pushed out with too great violence, they generally fall in before they come to maturity. The food ought to be very light and of a cooling nature, as panada, or bread boiled with equal quantities of milk and water, good apples roasted or boiled with milk, and sweetened with a little sugar, or such like. The most dangerous period of this disease is what we call the secondary fever. This generally comes on when the pock

begins to blacken or turn on the face, and most of those who die of the small-pox are carried off by this fever. Nature generally attempts at the turn of the small-pox, to relieve the patient by loose stools. Her endeavours by this way are by no means to be counteracted, but promoted: and the patient at the same time supported by food and drink of a nourishing and cordial nature. If, at the approach of the secondary fever, the pulse be very quick, hard, and strong, the heat intense, and the breathing laborious, with other symptoms of an inflammation of the breast, the patient must immediately be bled. The quantity of blood to be let must be regulated by the patient's strength, age, and the urgency of the symptoms. But, in the secondary fever, if the patient be faintish, the pustules become suddenly pale, and if there be great coldness of the extremities, blisters must be applied, and the patient must be supported with generous cordials. Wines, and even spirits, have sometimes been given in such cases with amazing success. It is generally necessary, after the small-pox is gone off, to purge the patient. If however the body has been open through the whole course of the disease, or if butter-milk and other things of an opening nature have been drunk freely after the height of the small-pox, purging becomes less necessary; but it ought never to be wholly neglected. For very young children, an infusion of senna and prunes, with a little rhubarb, may be sweetened with coarse sugar, and given in small quantities till it operates. Those who are farther advanced must take medicines of a sharper nature. For example, a child of five or six years of age may take eight or ten grains of fine rhubarb, in powder over night, and the same quantity of jalap in powder the next morning. This may be worked with fresh broth or water-gruel, and may be repeated three or four times, five or six days intervening betwixt each dose. For children farther advanced, and adults, the dose must be increased in

proportion to the age and constitution. When a cough, a difficulty of breathing or other symptoms of a consumption, succeed to the small-pox, the patient must be sent to a place where the air is good, and put upon a course of asses' milk, with such other treatment as hath already been directed in consumptions.

OF INOCULATION.

THIS salutary invention, which is the only effectual means of stopping the ravages of the small-pox, has been known in Europe above half a century; yet, like most other useful discoveries, it made at first but slow progress. No discovery can be of general utility, while the practise of it is kept in the hands of a few. The fears, the jealousies, the prejudices, and the opposite interests, of the faculty, are, and ever will be, the most effectual obstacles to the progress of any salutary discovery. Hence it is that the practise of inoculation never became, in any measure, general, even in England, till taken up by men not bred to physic. These not only render the practise more extensive, but likewise more safe, and, by acting under less restraint than the regular practitioners, taught them that the patient's greatest danger arose, not from the *want* of medical care, but from the *excess* of it. The present method of inoculating in Britain is to make two or three slanting incisions in the arm, so superficial as not to pierce quite through the skin, with a lancet wet with fresh matter taken from a ripe pustule; afterwards the wounds are closed up, and left without any dressing. Some make use of a lancet covered with the dry matter; but this is less certain, and ought never to be used unless where fresh matter cannot be obtained; when this is the case, the matter ought to be moistened by holding the lancet for some time in the steam of warm water. We do not find that inoculation is at all considered as a medical operation in foreign countries. In Turkey, whence we learned it,

it is performed by the women, and in the East Indies by the brachmins or priests. In this country it has been practised by numbers of the common people with astonishing success; and as the small-pox is now become an epidemical disease in most parts of the known world, there seems no other choice left, but to render the malady as mild as possible. It is a matter of small consequence, whether a disease be entirely extirpated or rendered so mild as neither to destroy life nor hurt the constitution; and that this may be done by inoculation, does not now admit of a doubt. The numbers who die under inoculation hardly deserves to be named. In the natural way one in four or five generally dies; but by inoculation not one of a thousand. Nay, some can boast of having inoculated ten thousand without the loss of a single patient. The most proper age for inoculating children is at two or three months old, before teething begins. Those who have constitutional diseases may nevertheless be inoculated; it will often mend the habit of body; but ought to be performed at a time when they are most healthy. Accidental diseases should always be removed before inoculation. It is generally thought necessary to regulate the diet for some time before the disease be communicated. In children, however, great alteration in diet is seldom necessary, their food being commonly of the most simple and wholesome kind, as milk, water-gruel, weak broths, bread, light pudding, mild roots, and white meats. We would recommend no other medical preparation than two or three mild purges, which ought to be suited to the age and strength of the patient. The success of inoculators does not depend on the preparation of their patients, but on their management of them while under the disease. Their constant care should be to keep them cool, and their bodies gently open, by which means the fever is kept low, and the eruption greatly lessened. The danger is seldom great when the pustules are few; and their number is generally in proportion

to the fever which precedes and attends the eruption. Hence the chief secret of inoculation consists in regulating the eruptive fever, which generally may be kept sufficiently low by the methods mentioned above. The regimen during the disease is in all respects the same as under the natural small-pox. The patient must be kept cool, his diet should be light, and his drink weak and diluting, &c. Should any bad symptoms appear, which is seldom the case, they must be treated in the same way as directed in the natural small pox. Purging is not less necessary after the small-pox by inoculation than in the natural way, and ought by no means to be neglected.

VACCINE INOCULATION is the term for a practice lately introduced of inoculating persons with the matter drawn from pustules which rise upon the teats of cows: this is said (by its supporters) to prevent patients from ever taking the natural small-pox. It has so far succeeded as to procure its inventor, Dr. Jenner, grants from the parliament of 30 500*l.* sterling for the communication of his discovery.

OF THE MEASLES.

THIS disease, like the small-pox, proceeds from infection, and is more or less dangerous according to the constitution of the patient, the season of the year, the climate, &c. It is usually preceded by a short cough, a heaviness of the head and eyes, drowsiness, and a running at the nose. There is an inflammation and heat in the eyes, with a defluxion of sharp tears, vomiting, and great acuteness of sensation, so that the patient cannot bear the light without pain. About the fourth day, small spots, resembling fleabites, appear, first upon the face, then upon the breast, and afterwards on the extremities: these may be distinguished from the small-pox by their scarcely rising above the skin. The fever, cough, and difficulty of breathing, instead of being removed by the eruption, as in the small-pox, are rather increased; but

the vomiting generally ceases. About the sixth or seventh day from the time of sickening, the measles begin to turn pale on the face, and afterwards upon the body; so that by the ninth day they entirely disappear. Such as die of the measles generally expire about the ninth day from the invasion, and are commonly carried off by inflammation of the lungs. The most favourable symptoms are, a moderate looseness, a moist skin, and a plentiful discharge of urine. When the eruption suddenly falls in, and the patient is seized with a delirium, he is in the greatest danger. If the measles turn too soon of a pale colour, it is an unfavourable symptom, as are also great weakness, vomitings, restlessness, and difficulty of swallowing. Purple or black spots appearing among the measles, are very unfavourable. When a continual cough, with hoarseness, succeeds the disease, there is reason to suspect an approaching consumption of the lungs.

CURE.—Our business in this disease is to assist nature by proper cordials, in throwing out the morbific matter, if her efforts be too languid; but, when they are too violent, they must be restrained by evacuations, and cool diluting liquors, &c. We ought likewise to endeavour to appease the most urgent symptoms, as the cough, restlessness, and difficulty of breathing. A cool regimen is necessary here, as well as in the small-pox. The food too must be light, and the drink diluting. The most suitable liquors are decoctions of liquorice, with marsh-mallow roots and sarsaparilla, infusions of linseed, marigolds, elder-flowers, balm-tea, clarified whey, barley-water, and such like. Bleeding is commonly necessary, particularly when the fever runs high, with difficulty of breathing, and great oppression at the breast; but if the disease be of a mild kind, bleeding may be omitted. If at the turn of the disease the fever assumes new vigour, and there appears great danger of suffocation, bleeding must be used accord-

ing to the patient's strength, and blisters must be applied, with a view to prevent the load from being thrown on the lungs, where if an inflammation should fix itself, the patient's life will be in imminent danger. In case the measles should suddenly disappear, the patient must be supported with wine and cordials. Blisters must be applied to the legs and arms, and the body rubbed all over with warm flannels. Should a cough, with difficulty of breathing, and other symptoms of a consumption, remain after the measles, small quantities of blood may be frequently let at proper intervals, as the patient's strength and constitution will permit. He ought likewise to drink asses' milk, to remove into a free air, and to ride daily on horseback.

OF THE SCARLET FEVER.

THE scarlet fever is so called from the colour of the patient's skin, which appears as if it were tinged with red wine. It begins like other fevers, with coldness and shivering, without any violent sickness. Afterwards the skin is covered with red spots, which are broader, more florid, and less uniform than the measles. They continue two or three days and then disappear; after which the cuticle, or scarf-skin, falls off.

CURE.—There is seldom any occasion for medicine in this disease, unless it is attended with putrid or malignant symptoms, in which case it is always dangerous; the patient is then not only affected with coldness and shivering, but with languor, sickness, and great oppression; to these succeed excessive heat, nausea, and vomiting, with a soreness of the throat; the pulse is extremely quick, but small and depressed; the breathing frequent and laborious; the skin hot, but not quite dry; the tongue moist, and covered with a whitish mucus: the tonsils inflamed and ulcerated. When the eruption appears, it brings no relief: on the contrary, the symptoms generally grow worse, and fresh ones come on, as purging, de-

lirium, &c. Should this disease be mistaken for a simple inflammation, and treated with repeated bleedings, purgings, and cooling medicines, as is sometimes the case, it generally proves fatal. The only medicines that can be depended on are cordials and antiseptics, as the Peruvian bark, wine, snake-root, and the like. The treatment must be in general similar to that of the putrid fever, or of the malignant ulcerous sore throat.

OF THE BILIOUS FEVER.

A CONTINUAL remitting or intermitting fever, accompanied with a copious evacuation of bile, either by vomit or stool, is denominated *bilious*. It generally makes its appearance about the end of summer, and ceases towards the approach of winter. It is most fatal in warm countries, especially where the soil is marshy, and when great rains are succeeded by sultry heats. Those who work without doors, and are exposed to the night air, are most liable to this kind of fever.

CURE.—If there are symptoms of inflammation, it will be necessary to bleed, and to put the patient upon cool diluting regimen, recommended in the inflammatory fever. Saline draughts may likewise be frequently administered, and the patient's body kept open by clysters or mild purgatives. But, if the fever should remit or intermit, bleeding will seldom be necessary. In this case a vomit may be administered, and, if the body be bound, a gentle purge; after which the Peruvian bark will generally complete the cure.

OF THE ERYSIPELAS, OR ST. ANTHONY'S FIRE.

THE erysipelas may be occasioned by violent passions or affections of the mind; as fear, anger, &c. When the body has been heated to a certain degree, and is immediately exposed to the cold air, so that the perspiration is suddenly checked, an erysipelas

will often ensue. It may also be occasioned by drinking to excess, by continuing too long in a warm bath, or by any thing that overheats the blood. If any of the natural evacuations be obstructed, or in too small a quantity, it may cause an erysipelas. The same effect will follow from the stoppage of artificial evacuations ; as issues, setons or the like. The disorder comes on with shivering, thirst, loss of strength, pain in the head and back, heat, restlessness, and a quick pulse : to which may be added vomiting and sometimes a delirium. On the second, third, or fourth day, the part swells, becomes red, and small pustules appear: at which time the fever generally abates. When the erysipelas is large, deep, and affects a very sensible part of the body, the danger is great. If the red colour change into a livid or black, it will end in a mortification. Sometimes the inflammation cannot be discussed, but comes to a suppuration ; in which case fistulas, a gangrene, or mortification often ensue. Such as die of this disease, are commonly carried off by the fever, which is attended with difficulty of breathing, and sometimes with a delirium and great drowsiness. They generally die about the seventh or eighth day.

CURE.—In this complaint much mischief is often done by medicines, especially by external applications: whereas the principal object should be to promote perspiration, which has a great tendency to carry off the disease. It is common to bleed in the erysipelas ; but this likewise requires caution. If, however, the fever be high, the pulse hard and strong, and the patient vigorous, it will be proper to bleed ; but the quantity must be regulated by these circumstances, and the operation repeated as the symptoms may require. If the patient has been accustomed to strong liquors, and the disease attacks his head, bleeding is absolutely necessary. Bathing the feet and legs frequently in lukewarm water, when the disease attacks the face or brain, has an excellent effect. It

tends to make a derivation from the head, and seldom fails to relieve the patient. When bathing proves ineffectual, poultices, or sharp sinapisms, may be applied to the soles of the feet for the same purpose. In cases where bleeding is requisite, it is likewise necessary to keep the body open. This may be effected by emollient clysters, or small doses of nitre and rhubarb. Some indeed recommend very large doses of nitre in the erysipelas; but nitre seldom sits easy on the stomach when taken in large doses. It is however one of the best medicines when the fever and inflammation run high. Half a drachm of it, with four or five grains of rhubarb, may be taken in the patient's ordinary drink four times a-day. When the erysipelas seizes the head so as to occasion a delirium or stupor, blisters must be applied to the neck, or behind the ears, and sharp cataplasms laid so the soles of the feet. In what is commonly called the *scorbutic erysipelas*, which continues for a considerable time, it will only be necessary to give gentle laxatives, and such things as purify the blood, and promote the perspiration; and after the inflammation has been checked by opening medicines, the decoction of woods and bitter herbs may be drunk, as recommended for this disease in the Herbal.

OF THE INFLAMMATION OF THE BRAIN.

THE symptoms which usually precede a true inflammation of the brain, are pain of the head, redness of the eyes, a violent flushing of the face, disturbed sleep, or a total want of it, great dryness of the skin, costiveness, a retention of urine, a small dropping of blood from the nose, singing of the ears, and extreme sensibility of the nervous system. When the brain itself is inflamed, the pulse is always soft and low; but when the inflammation only affects the integuments of the brain, viz. the *dura* and *pia matre*, it is hard.

CURE.—As this disease often proves fatal in a few days, it requires the most speedy applications. When it is prolonged, or improperly treated, it sometimes ends in madness, or a kind of stupidity which continues for life. Two things are chiefly to be attended to in the cure, viz. to lessen the quantity of blood in the brain, and to retard the circulation towards the head. Nothing more certainly relieves the patient than a free discharge of blood from the nose. When this comes of its own accord, it is by no means to be stopped, but rather promoted by applying cloths dipped in warm water to the part. When bleeding at the nose does not happen spontaneously, it may be provoked by putting a straw, or any other sharp body, up the nostril. Bleeding in the temporal arteries greatly relieves the head; but, as this operation cannot always be peformed, we would recommend in its stead bleeding in the jugular veins. When the patient's pulse and spirits are so low, that he cannot bear bleeding with the lancet, leeches may be applied to the temples. These not only draw off the blood more gradually, but, by being applied nearer to the part affected, generally give more immediate relief. If the inflammation of the brain be occasioned by the stoppage of evacuations either natural or artificial, as the menses, issues, setons, or such like, all means must be used to restore them as soon as possible, or to substitute others in their stead. The patient's body must be kept open by stimulating clysters or smart purges; and small quantities of nitre ought frequently to be mixed with his drink. Two or three drachms, or more, if the case be dangerous, may be used in the space of twenty-four hours. If the disease proves obstinate, and does not yield to the medicines, it will be necessary to apply a blistering-plaster to the whole head.

OF THE INFLAMMATION OF THE EYES.

THIS disorder is attended with acute pain, heat, red-

ness, and swelling.—The patient is not able to bear the light, and sometimes he feels a pricking pain, as if his eyes were pierced with a thorn. The pulse is generally quick and hard, with some degree of fever. When the disease is violent, the neighbouring parts swell, and there is a throbbing or pulsation in the temporal arteries, &c. A slight inflammation of the eyes, especially from an external cause, is easily cured: but, when the disease is violent, and continues long, it often leaves specks upon the eyes, or dimness of sight, and sometimes total blindness.

CURE.—The patient must abstain from every thing of a heating nature. His food should consist chiefly of mild vegetables, weak broths, and gruels. His drink may be barley-water, balm-tea, common whey, and such like. Bleeding, in a violent inflammation of the eyes, is always necessary. This should be performed as near the part affected as possible. An adult may lose ten or twelve ounces of blood from the jugular vein, and the operation may be repeated according to the urgency of the symptoms. If it should not be convenient to bleed in the neck, the same quantity may be let from the arm, or any other part of the body. Leeches are often applied to the temples, or under the eyes with good effect. The wounds must be suffered to bleed for some hours: and, if the bleeding stop soon, it may be promoted by the application of cloths dipt in warm water. In obstinate cases, it will be necessary to repeat this operation several times. Opening and diluting medicines are by no means to be neglected; but if the inflammation does not yield to these evacuations, blisters must be applied to the temples, behind the ears, or upon the neck, and kept open for some time. I have seldom known these, if long enough kept open, fail to remove the most obstinate inflammation of the eyes; but, for this purpose, it is often necessary to continue the discharge for several weeks. Those who are liable to frequent returns of this disease ought constantly

to have an issue in one or both arms, or a seton cut betwixt the shoulders. Bleeding or purging in the spring and autumn will be very beneficial to such persons.

OF THE QUINSY, OR INFLAMMATORY SORE THROAT.

THIS disease is frequently attended with great danger. When the inflammation comes on, the parts appear red and swelled: the patient complains of pain in swallowing; his pulse is quick and hard, with other symptoms of a fever. If blood be let, it is generally covered with a tough coat of a whitish colour, and the patient spits a tough phlegm. As the swelling and inflammation increase, the breathing and swallowing become more difficult; the pain affects the ears; the eyes appear red; and the face swells. When the breathing is laborious, with straitness of the breast, and anxiety, the danger is great. Though the pain in swallowing be very great, yet, while the patient breathes easy, there is not so much danger. An external swelling is no unfavourable symptom; but if it suddenly falls, and the disease affects the breast, the danger is very great. When a quinsy is the consequence of some other disease, which has already weakened the patient, his situation is dangerous. A frothing at the mouth, and a swelled tongue, a pale ghastly countenance, and coldness of the extremities, are fatal symptoms.

CURE.—It is peculiarly necessary that the neck be kept warm; for which purpose several folds of soft flannel may be wrapt round it. The jelly of black currants is a medicine very much in esteem for complaints of the throat; and indeed it is of some use. It should be almost constantly kept in the mouth, and swallowed down leisurely. It may likewise be mixed in the patient's drink, or taken any other way. When it cannot be obtained, the jelly of red currants or of mulberries, may be used in its stead. Gargles

are also very beneficial; they may be made of sage-tea, with a little vinegar and honey; and may be used three or four times a-day: and, if the patient be troubled with tough viscid phlegm, the gargle may be rendered more sharp and cleansing by adding to it a tea-spoon-full of spirit of sal ammoniac. There is no disease wherein the benefit of bathing the feet and legs in lukewarm water is more apparent: that practice ought therefore never to be neglected. If the inflammation be violent, it will be proper as soon as she symptoms appear, to bleed in the arm, or rather in the jugular vein, and to repeat the operation if circumstances require. The body should likewise be kept gently open. This may be done by giving the patient for his ordinary drink a decoction of figs and tamarinds, or small doses of rhubarb and nitre. Good effects are often produced from a bit of sal prunel, or purified nitre, held in the mouth and swallowed down as it melts. This promotes the discharge of saliva, by which means it answers the end of a gargle, while at the same time it abates the fever, by promoting the discharge of the urine, &c. Blistering upon the neck or behind the ears, in violent inflammations of the throat, is very beneficial; and in bad cases it will be very necessary to lay a blistering plaster quite across the throat, so as to reach from ear to ear. After the plasters are taken off, the parts ought to be kept running by the application of issue ointment, till the inflammation is gone; otherwise, upon their drying up, the patient will be in danger of a relapse. When a difficulty of swallowing is not attended with an acute pain or inflammation, it only requires that the part be kept warm, and the throat frequently gargled with something that may gently stimulate the glands, as a decoction of figs with vinegar and honey; to which may be added a little mustard, or a small quantity of spirits. But this gargle is never to be used where there are signs of inflammation. Those who are sub-

ject to inflammations of the throat, in order to avoid that disease, and many others, ought to live temperately. Such as do not choose to observe this rule, must have frequent recourse to purging and other evacuations, to discharge the superfluous humours. They ought likewise to beware of catching cold, and should abstain from aliment and medicines of an astringent or stimulating nature.

OF THE MALIGNANT OR ULCEROUS SORE THROAT.

THIS is evidently a contagious disease, and is generally communicated by infection. Whole families, and even entire villages, often receive the infection from one person. Whatever tends to produce putrid or malignant fevers may likewise occasion the putrid ulcerous sore throat, as unwholesome air, damaged provisions, neglect of cleanliness, &c. It begins with alternate fits of shivering and heat. The pulse is quick, but low, and unequal, and generally continues so through the whole course of the disease. The tongue is white, and generally moist, which distinguishes this from an inflammatory disease. Upon looking into the throat, it appears swelled and of a florid red colour. Pale or ash-couloured spots however, are here and there interspersed, and sometimes one broad patch or spot, of an irregular figure, and pale white colour, surrounded with florid red, only appears. These whitish spots or sloughs cover so many ulcers. The putrid ulcerous sore throat may be distinguished from the inflammatory by the vomiting and looseness with which it is generally ushered in; the foul ulcers in the throat covered with a white or livid coat; and by the excessive weakness of the patient; with other symptoms of a putrid fever.

CURE.—The treatment in this kind of sore throat is entirely different from that which is proper in the inflammatory. All evacuations, as bleeding, purging, &c. which weaken the patient, must be avoided.

Cooling medicines, as nitre and cream of tartar, are likewise hurtful. Strengthening cordials alone can be used with safety; and these ought never to be neglected. If, at the beginning, there is a great nausea, or inclination to vomit, the patient must drink an infusion of green tea, camomile-flowers, or *carduus benedictus*, in order to cleanse the stomach. If these are not sufficient, he may take a few grains of the powder of ipecacuanha, or any other gentle vomit. If the disease is mild, the throat may be gargled with an infusion of sage or rose leaves, to a gill of which may be added a spoonful or two of honey, and as much vinegar as will make it agreeably acid; but, when the symptoms are urgent, it will be of great benefit if the patient frequently receives into his mouth through an inverted funnel, the steams of warm vinegar, myrrh, and honey. But, when the putrid symptoms run high, and the disease is attended with danger, the only medicine that can be depended upon is the Peruvian bark. It may be taken in substance, if the patient's stomach will bear it. If not, an ounce of bark grossly powdered, with two drachms of Virginian snake-root, may be boiled in a pint and a half of water, to half a pint; to which a tea-spoonful of the elixir of vitriol may be added, and an ordinary tea-cupful of it taken every three or four hours. Blisters are very beneficial in this disease, especially when the patient's pulse and spirits are low. They may be applied to the throat, behind the ears, or upon the back part of the neck. If the discharge of blood from the nose happens, the steams of warm vinegar may be received up the nostrils frequently; and the drink must be sharpened with spirits of vitriol, or tincture of roses. In case of a strangury, the belly must be fomented with warm water, and emollient clysters given three or four times a day. After the violence of the disease is over, the body should still be kept open with mild purgatives; as manna, senna, rhubarb, or the like.

OF COLDS AND COUGHS.

COLDS are the effect of an obstructed perspiration; and almost every cold is a kind of fever, which only differs in degree from some of those that have already been treated of. No age, sex, or constitution, is exempted from this disease; neither is it in the power of any medicine or regimen to prevent it. The inhabitants of every climate are liable to catch cold, nor can even the greatest circumspection defend them at all times from its attack. Indeed, if the human body could be kept constantly in an uniform degree of warmth, such a thing as catching cold would be impossible: but, as that cannot be effected by any means, the perspiration must be liable to many changes. When oppression of the breast, a stuffing of the nose, unusual weariness, pain of the head, &c. give ground to believe that the perspiration is obstructed, or, in other words, that the person has caught cold, he ought immediately to lessen his diet, at least the usual quantity of his solid food, and to abstain from all strong liquors. Would people sacrifice a little time to ease and warmth, and practice a moderate degree of abstinence, when the first symptoms of a cold appear, we have reason to believe that most of the bad effects which flow from an obstructed perspiration might be prevented. But, after the disease has gathered strength by delay, all attempts to remove it often prove vain. A pleurisy, a peripneumony, or a fatal consumption of the lungs, are often the effects of common colds, notwithstanding people affect to treat them with so much indifference and neglect, merely because they are only colds. Hence it is, that colds destroy such numbers of mankind. Like an enemy despised, they gather strength from delay, till, at length, they become invincible. It is certain, however, that colds may be too much indulged. When a person, for every slight cold, shuts himself up in a warm room, swallows medi-

cine, and drinks great quantities of warm liquor, it may occasion such a general relaxation of the solids as will not be easily removed. Bathing the feet in warm water, lying in bed, and drinking warm water-gruel, or other weak liquors, will sooner take off spasm, and restore the perspiration, than all the hot sudorific medicines in the world. This is all that is necessary for removing a common cold; and, if this course be taken at the beginning, it will seldom fail. When the symptoms do not yield to abstinence, warmth, and diluting liquors, there is reason to fear the approach of some other disease, as an inflammation of the breast, an ardent fever, or the like; and the patient should then be treated accordingly. The chief secret of preventing colds lies in avoiding, as far as possible, all extremes, either of heat or cold, and in taking care when the body is heated, to let it cool gradually.

OF A COMMON COUGH.

A COUGH is generally the effect of a cold, which has either been improperly treated or entirely neglected When it proves obstinate, there is always reason to fear the consequence, as this shows a weak state of the lungs, and is often the forerunner of a consumption. If the cough be violent, and the patient young and strong, with a hard quick pulse, bleeding will be proper; but, in weak and relaxed habits, bleeding rather prolongs the disease. When the patient spits freely, bleeding is unnecessary, and sometimes hurtful, as it tends to lessen that discharge. When a cough is occasioned by acrid humours tickling the throat and fauces, the patient should keep some soft pectoral lozenges almost constantly in his mouth; as the Pontefract liquorice cakes, barley-sugar, the common balsamic lozenges, Spanish-juice, &c. These blunt the acritnony of the humours, and, by taking off their stimulating quality, help to appease the cough. In obstinate coughs, proceeding from a flux of humours

upon the lungs, it will often be necessary, besides expectorating medicines, to have recourse to issues, setons, or some other drain. In this case I have often observed the most happy effects from a Burgundy-pitch plaster applied between the shoulders. About the bulk of a nutmeg of Burgundy-pitch maybe spread thin upon a piece of soft leather, about the size of the hand, and laid between the shoulder-blades. It may be taken off and wiped every three or four days, and ought to be renewed once a fortnight or three weeks. This is indeed a cheap and simple medicine, and consequently apt to be dispised ; but we will venture to affirm that the whole *materia medica* does not afford an application more efficacious in almost every kind of cough. It has not, indeed, always an immediate effect; but, if kept on for some time, it will succeed where most other medicines fail. But coughs proceed from many other causes besides defluxions upon the lungs. In these cases the cure is not to be attempted by pectoral medicines. Thus, in a cough proceeding from a foulness and debility of the stomach, syrups, oil, mucilages, and all kinds of balsamic medicines, do hurt. The *stomach-cough* may be known from one that is owing to a fault in the lungs by this, that in the latter the patient coughs whenever he inspires, or draws in his breath fully ; but in the former that does not happen.

CURE.—The cure of this cough depends chiefly upon cleansing and strengthening the stomach ; for which purpose gentle vomits and bitter purgatives are most proper. Thus, after a vomit or two, the sacred tincture, as it is called, may be taken for a considerable time in the dose of one or two table-spoonfuls twice a day, or as often as it is found necessary, to keep the body gently open. People may make this tincture themselves, by infusing an ounce of *hiera picra* in an English pint of white wine, letting it stand a few days, and then straining it. In coughs which proceed from a debility of the stomach, the

Peruvian bark is likewise of considerable service. It may either be chewed, taken in powder, or made into a tincture along with other stomachic bitters. A *nervous cough* can only be removed by change of air and proper exercise. Immersing the feet and hands in warm water will often appease the violence of a nervous cough. When a cough is only the symptom of some other malady, it is in vain to attempt to remove it, without first curing the disease from which it proceeds. Thus, when a cough is occasioned by *teething*, keeping the body open, scarifying the gums, or whatever facilitates the cutting of the teeth, likewise appeases the cough. In like manner, when *worms* occasion a cough, such medicines as remove these vermin will generally cure the cough; as bitter purgatives, oily clysters, and such like. Women during the last month of pregnancy, are often greatly afflicted with a cough, which is generally relieved by bleeding and keeping the body open. They ought to avoid all flatulent food, and to wear a loose easy dress.

OF THE WHOOPING OR CHIN COUGH.

This cough seldom affects adults, but often proves fatal to children. Whatever hurts the digestian, obstructs the perspiration, or relaxes the solids, disposes to this disease: consequently its cure must depend upon cleansing and strengthening the stomach, bracing the solids, and, at the same time, promoting perspiration and the different secretions.

Cure.—One of the most effectual remedies in the chin-cough is change of air. This often removes the malady, even when the change seems to be from a purer to a less wholesome air. This may in some measure depend on the patient's being removed from the place where the infection prevails. Most of the diseases of children are infectious: nor is it at all uncommon to find the chin-cough prevailing in one town or village, when another, at a very small dis-

tance, is quite free from it. But whatever be the cause we are sure of the fact. No time ought therefore to be lost in removing the patient to some distance from the place where he caught the disease, and, if possible, into a more pure and warm air. When the disease proves violent, and the patient is in danger of being suffocated by the cough, he ought to be bled, especially if there be a fever with a hard full pulse. But as the chief intent of bleeding is to prevent an inflammation of the lungs, and to render it more safe to give vomits, it will seldom be necessary to repeat the operation; yet, if there be symptoms of an inflammation of the lungs, a second, or even a third, bleeding may be requisite. Vomits not only cleanse the stomach, which in this disease is generally loaded with viscid phlegm, but they likewise promote the perspiration and other secretions; and ought therefore to be repeated according to the obstinacy of the disease. They should not be strong; gentle vomits frequently repeated are less dangerous, and more beneficial than strong ones. Many people believe that oily, pectoral, and balsamic, medicines, possess wonderful virtues for the cure of the chin-cough, and accordingly exhibit them plentifully to patients of every age and constitution, without considering that every thing of this nature, must load the stomach, hurt the digestion, and of course aggravate the disorder. The *millepedes*, or woodlice are greatly recommended for the cure of a chin-cough. Those, who choose to make use of these insects, may infuse two ounces of them bruised in an English pint of small white-wine for one night. Afterwards the liquor may be strained through a cloth, and a table spoonful of it given to the patient three or four times a-day. Opiates are sometimes necessary to allay the violence of the cough. For this purpose a little of the syrup of poppies, or five, six, or seven drops of laudanum, according to the age of the patient, may be taken in a cup of hyssop or penny-royal tea, and repeated oc-

casionally. The garlic ointment is a well known remedy in North Britain for the chin-cough. It is made by beating in a mortar, garlic with an equal quantity of hog's lard. With this the soles of the feet may be rubbed twice or thrice a-day; but the best method is to spread it upon a rag, and apply it in the form of a plaster. It should be renewed every night and morning at least, as the garlic soon loses its virtue. This is an exceeding good medicine both in the chin-cough and in most other coughs of an obstinate nature. It ought not, however, to be used when the patient is very hot or feverish, lest it should increase those symptoms.

INFLAMMATION OF THE STOMACH.

An inflammation of the stomach may proceed from any of the causes which produce an inflammatory fever; as cold liquor drank while the body is warm obstructed perspiration, or the sudden striking in of any eruption. It is attended with a fixed pain and burning heat in the stomach; great restlessness and anxiety; a small, quick, and hard pulse; vomiting, or, at least, a nausea, and sickness; excessive thirst; coldness of the extremities; difficulty of breathing; cold clammy sweats; and sometimes convulsions and fainting fits. The stomach is swelled and often feels hard to the touch. One of the most certain signs of this disease is the sense of pain, which the patient feels upon taking any kind of food or drink, especially if it be either too hot or too cold.

CURE.—All the acrimonious, heating, and irritating food and drink are carefully to be avoided. The weakness of the patient may deceive the by-standers, and induce them to give him wines, spirits, or other cordials; but these never fail to increase the disease, and often occasion sudden death. The inclination to vomit may likewise impose on the attendants, and make them think a vomit necessary; but that too is almost certain death. Bleeding is absolutely neces-

sary, and is almost the only thing that can be depended on. When the disease proves obstinate, it will often be proper to repeat this operation several times, nor must the low state of the pulse deter us from doing so. The pulse indeed generally rises upon bleeding, and, as long as that is the case, the operation is safe. Frequent fomentations with lukewarm water, or a decoction of emollient vegetables, as recommended in the Herbal, are likewise beneficial. Flannel cloths dipped in these must be applied to the region of the stomach, and removed as they grow cool. In this and all other inflammations of the bowels, an epispastic, or blistering-plaster, applied over the part affected, is one of the best remedies known. The only internal medicines which can with safety be recommended are mild clysters. These may be made of warm water, or thin water-gruel; and if the patient be costive, a little sweet oil, honey, or manna, may be added. Clysters answer the purpose of an internal fomentation, while they keep the body open, and at the same time nourish the patient, who is often in this disease unable to retain any food upon his stomach. For these reasons they must not be neglected, as the patient's life may depend on them

INFLAMMATION OF THE INTESTINES.

THIS is one of the most painful and dangerous diseases that mankind is liable to. It generally proceeds from the same causes as the inflammation of the stomach; to which may be added costiveness, worms, eating unripe fruits, or great quantities of nuts, drinking hard windy malt liquors, as stale bottled beer or ale, sour wine, cider, &c. The inflammation of the intestines is denominated *iliac passion*, *enteritis*, &c. according to the name of the parts affected. The treatment however is nearly the same, whatever part of the intestinal canal be the seat of the disease. The symptoms are nearly the same as in the fore-

going disease: only the pain, if possible is more acute, and is situated lower. The vomiting is likewise more violent, and sometimes even the excrements, together with the clysters and suppositories, are discharged by the mouth. While the pain shifts, and the vomiting only returns at certain intervals, and while the clysters pass downwards, there is ground to hope: but, when the clysters and fæces are vomited, and the patient is exceeding weak, with a low fluttering pulse, a pale countenance, and a disagreeable or stinking breath, there is great reason to fear that the consequences will prove fatal. Clammy sweats, black fœtid stools, with a small intermmitting pulse, and a total cessation of pain, are signs of a mortification already begun, and of approaching death.

Cure.—Bleeding, in this as well as in the inflammation of the stomach, is of the greatest importance. It should be performed as soon as the symptoms appear, and must be repeated according to the strength of the patient and the violence of the disease. A blister is likewise to be applied immediately over the part where the most violent pain is. This not only relieves the pain of the bowels, but even clysters and purgative medicines, which before had no effect, will operate when the blisters begin to rise. The patient's feet and legs should frequently be bathed in warm water, and cloths dipped in it applied to the belly. Bladders filled with warm water may likewise be applied to the region of the navel, and warm bricks, or bottles filled with warm water, to the soles of the feet. If the disease does not yield to clysters and fomentations, recourse must be had to pretty strong purgatives; but as these by irritating the bowels, often increase their contraction, and by that means frustrate their own intention, it will be necessary to join them with opiates, which by allaying the pain, and relaxing the spasmodic contractions of the guts, greatly assist the operation of purgatives in this case. What answers the purpose of opening the body very

well, is a solution of the bitter purging salts. Two ounces of these may be dissolved in an English pint of warm water, or thin gruel, and a teacup-full of it taken every half hour till it operates. At the same time fifteen, twenty, or twenty-five drops of laudanum may be given in a glass of peppermint or simple cinnamon-water, to appease the irritation, and prevent the vomiting, &c. But it often happens that no liquid whatever will stay on the stomach. In this case the patient must take purging pills. I have generally found the following answer very well; Take jalap in powder, and vitriolated tartar, of each half a drachm; opium one grain; Castile soap as much as will make the mass fit for pills. These must be taken at one dose, and if they do not operate in a few hours, the dose may be repeated. If a stool cannot be procured by any of the above means, it will be necessary to immerse the patient in warm water up to the breast. The patient must continue in the water as long as he can easily bear it without fainting; and, if one immersion has not the desired effect, it may be repeated as soon as the patient's strength and spirits are recruited. It is more safe for him to go frequently into the bath than to continue too long at a time; and it is often necesary to repeat it several times before it has the desired effect. In desperate cases it is common to give quicksilver. This may be given to the quantity of several ounces or even a pound, but should not exceed that. When there is reason to suspect a mortification of the guts, this medicine ought not to be tried; in that case it cannot cure the patient, and will only hasten his death. But when the obstruction is occasioned by any cause that can be removed by force, quicksilver is not only a proper medicine, but the best that can be administered, as it is the fittest body we know for making its way through the intestinal canal.

OF THE CHOLIC.

THE cholic has a great resemblance to the two preceding diseases, both in its symptoms and method of cure. It is generally attended with costiveness and acute pain of the bowels; and requires diluting diet, evacuations, fomentatations, &c. Cholics are variously denominated, according to their causes, as the *flatulent*, the *bilious*, the *hysteric*, the *nervous*, *&c.*

CURE.—When the disease proceeds from windy liquor, green fruit, sour herbs, or the like, the best medicine on the first appearance of the symptoms is a drachm of brandy, gin, or any good spirits. The patient should likewise sit with his feet upon a warm hearth-stone, or apply warm bricks to them; and warm cloths may be applied to his stomach and bowels. This is the only cholic wherein ardent spirits, spiceries, or any thing of a hot nature, may be ventured upon. Nor indeed are they to be used here unless at the very beginning, before any symptoms of inflammation appear. The bilious cholic is attended with very acute pains about the region of the navel. The patient complains of great thirst, and is generally costive. He vomits a hot, bitter, yellow-coloured bile, which, being discharged, seems to afford some relief, but is quickly followed by the same violent pain as before. As the distemper advances, the propensity to vomit sometimes increases so as to become almost continual, and the proper motion of the intestines is so far perverted, that there are all the symptoms of an impending iliac passion. If the patient be young and strong, and the pulse full and frequent, it will be proper to bleed, after which clysters may be administered. Clear whey or gruel, sharpened with the juice of lemon, or cream of tartar, must be drunk freely: it will be necessary likewise to foment the belly with cloths dipped in warm water: and, if this should not succeed, the patient must be immersed up to the breast in warm water. In the

bilious cholic the vomiting is often very difficult to restrain. When this happens, the patient may drink a decoction of toasted bread, or an infusion of garden mint in boiling water. Such as are liable to frequent returns of the bilious cholic should use flesh sparingly, and live chiefly upon a light vegetable diet. They should likewise take frequently a dose of cream of tartar with tamarinds, or any other cool acid purge. The *hysteric* cholic bears a great resemblance to the bilious. It is attended with acute pains about the region of the stomach, vomiting, &c. But what the patient vomits in this case is commonly of a greenish colour. There is great sinking of the spirits, with dejection of mind and difficulty of breathing, which are the characteristic symptoms of this disorder. Sometimes it is accompanied with the jaundice; but this generally goes off of its own accord in a few days. In this cholic all evacuations, as bleeding, purging, vomiting, &c. do hurt. Every thing that weakens the patient, or sinks the spirits, is to be avoided. If however the vomiting should prove violent, lukewarm water, or small posset, may be drunk to cleanse the stomach. Afterwards the patient may take fifteen, twenty, or twenty-five drops of liquid laudanum in a glass of cinnamon-water. This may be repeated every ten or twelve hours, till the symptoms abate. The *nervous* cholic prevails among miners, smelters of lead, plumbers, the manufacturers of white lead, &c. It is very common in the cider-counties of England, and is supposed to be occasioned by the leaden vessels used in preparing that liquor. No disease of the bowels is attended with more excruciating pain than this. Nor is it soon at an end. I have known it to continue eight or ten days with very little intermission, the body all the while continuing bound in spite of medicine; yet at length yield, and the patient recover. It generally however leaves the patient weak, and often ends in a palsy. The general treatment of

this disease is the same with that of the iliac passion, or inflammation of the bowels.

INFLAMMATION OF THE KIDNIES.

This disease may proceed from any of those causes which produce an inflammatory fever. It may likewise be occasioned by wounds or bruises of the kidnies, small stones or gravel lodging within them; by hard riding or walking, especially in hot weather; or whatever drives the blood too forcibly into the kidnies, may occasion this malady.

Cure.—Every thing of a heating or stimulating nature is to be avoided. Emollient and thin liquors must be plentifully drunk; as clear whey, or balm tea sweetened with honey, decoctions of marsh-mallow roots, with barley and liquorice, &c. Bleeding is generally necessary, especially at the beginning. Ten or twelve ounces may be let from the arm or foot; and, if the pain and inflammation continue, the operation may be repeated in twenty-four hours, especially if the patient be of a full habit. Leeches may likewise be applied to the hæmorrhoidal veins, as a discharge from these will greatly relieve the patient. Cloths dipped in warm water, or bladders filled with it. must be applied as near as possible to the part affected, and renewed as they grow cold. If the bladder be filled with a decoction of mallows and camomile flowers, to which a little saffron is added, and mixed with about a third part of new milk, it will be still more beneficial. Emollient clysters ought frequently to be administered; and, if these do not open the body, a little salt and honey, or manna may be added to them. The same course is to be followed where gravel or a stone is lodged in the kidney; but, when the gravel or stone is separated from the kidney, and lodges in the ureter, it will be proper, besides the fomentations, to rub the small of the back with sweet oil, and to give gentle diuretics; as juniper-water sweetened with the syrup of marsh-mal-

lows; a tea-spoonful of the sweet spirits of nitre, with a few drops of laudanum, may now and then be put up in a cup of the patient's drink. He ought likewise to take exercise on horseback, or in a carriage, if he be able to bear it.

INFLAMMATION OF THE BLADDER.

THE inflammation of the bladder proceeds, in a great measure, from the same causes as that of the kidnies. It is known by an acute pain towards the bottom of the belly, and difficulty of passing urine, with some degree of fever, a constant inclination to go to stool, and a perpetual desire to make water. This disease must be treated on the same principles as the one immediately preceding. The patient should abstain from every thing that is of a hot, acrid, and stimulating quality, and should live entirely upon small broths, gruels, or mild vegetables. But a stoppage of urine may proceed from other causes besides an inflammation of the bladder; as a swelling of the hæmorrhoidal veins; hard *fæces* lodged in the *rectum;* a stone in the bladder; excrescences in the urinary passages; a palsy of the bladder, hysteric affections, &c. In all which cases, mild and gentle applications are the safest; strong diuretic medicines, or things of an irritating nature, generally increase the danger. I have known some persons kill themselves by introducing probes into the urinary passages, to remove, as they thought, somewhat that obstructed the discharge of urine; and others bring on a violent inflammation of the bladder, by using strong diuretics, as oil of turpentine, &c. for that purpose.

INFLAMMATION OF THE LIVER.

THIS disease is known by a painful tention of the right side under the false ribs, attended with some degree of fever, a sense of weight or fullness of the part, difficulty of breathing, loathing of food, great

thirst, with a pale or yellowish colour of the skin and eyes. This disease, if properly treated, is seldom mortal. If it ends in a suppuration, and the matter cannot be discharged outwardly, the danger is then great. When the scirrhus of the liver ensues, the patient, if he observes a proper regimen, may nevertheless live a number of years; but, if he indulge in animal food and strong liquors, or take medicines of an acrid or irritating nature, the scirrhus will be converted into a cancer which must infallibly prove fatal.

CURE.—The same regimen is to be observed in this as in other inflammatory disorders. All hot things are to be carefully avoided and cool diluting liquors, as whey, barley-water, &c., drunk freely. The food must be light and thin, and the body, as well as the mind, kept easy and quiet. Bleeding is proper at the beginning, and it will often be necessary, even though the pulse should not feel hard, to repeat it. All violent purgatives are to be avoided; the body however must be kept gently open. A decoction of tamarinds, with a little honey or manna, will answer this purpose very well. The side affected must be fomented in the manner directed in the foregoing diseases. Mild laxative clysters should be frequently administered; and, if the pain should notwithstanding continue violent, a blistering plaster may be applied over the part affected. Medicines which promote the secretion of urine, have a very good effect here. For this purpose, half a drachm of purified nitre, or a tea-spoonful of the sweet spirits of nitre, may be taken in a cup of the patient's drink three or four times a-day. All inflammations of the viscera must in general be treated upon the same principles as those already mentioned. The chief rule with respect to all of them, is to let blood, to avoid every thing that is strong, or of a heating nature, to apply warm fomentations to the part affected and to cause the patient to drink a sufficient quantity of warm diluting liquors.

OF THE CHOLERA MORBUS.

THE cholera morbus is a violent purging and vomiting, attended with gripes, sickness, and a constant desire to go to stool. It comes on suddenly, and is most common in autumn. There is hardly any disease that kills more quickly than this, when proper means are not used in due time for removing it. It is generally preceded by the heart-burn, sour belchings, and flatulencies, with pain of the stomach and intestines. To these succeed excessive vomiting, and purging of green, yellow, or blackish-coloured bile, with a distention of the stomach, and violent griping pains. There is likewise a great thirst, with a very quick unequal pulse, and often a fixed acute pain about the region of the navel. As the disease advances, the pulse often sinks so low as to become quite imperceptible, the extremeties grow cold, or cramped, and are often covered with a clammy sweat; the urine is obstructed, and there is a palpitation of the heart. Violent hiccup, fainting, and convulsions, are the signs of approaching death.

CURE.—At the beginning of this disease, the efforts of nature to expel the offending cause, should be assisted, by promoting the purging and vomiting. For this purpose the patient must drink freely of diluting liquors; as whey, butter-milk warm water, thin water-gruel, small posset, or, what is preferable to any of them, very weak chicken broth. This should not only be drunk plentifully to promote the vomiting, but a clyster of it given every hour in order to promote the purging. Warm negus, or strong wine whey, will likewise be necessary to support the patient's spirits, and promote perspiration. His legs should be bathed in warm water, and afterwards rubbed with flannel cloths, or wrapped in warm blankets, aud warm bricks applied to the soles of his feet. Flannels wrung out of warm spirituous fomentations should likewise be applied to the region

of the stomach. When the violence of the disease is over, to prevent a relapse, it will be necessary, for some time, to continue the use of small doses of laudanum. Ten or twelve drops may be taken in a glass of wine, at least twice a day, for eight or ten days. The patient's food ought to be nourishing, but taken in small quantities, and he should use moderate exercise. As the stomach and intestines are generally much weakened, an infusion of the bark, or bitter herbs, in small wine, sharpened with the elixir of vitriol, may be drunk for some time.

OF A DIARRHŒA, OR LOOSENESS.

A LOOSENESS, in many cases, is not to be considered as a disease, but rather as a salutary evacuation. It ought therefore never to be stopped unless when it continues too long, or evidently weakens the patient.

CURE.—A looseness, occasioned by the obstruction of any customary evacuation, generally requires bleeding. If that does not succeed, other evacuations may be substituted in the room of those which are obstructed. At the same time every method is to be taken to restore the usual discharges, as not only the cure of the disease, but the patient's life may depend on this. A diarrhœa, or looseness, which proceeds from violent passions or affections of the mind, must be treated with the greatest caution Vomits in this case are highly improper. Nor are purges safe, unless they be very mild, and given in small quantities. Opiates, and other anti-spasmodic medicines, are most proper. Ten or twelve drops of liquid laudanum may be taken in a cup of valerian, or penny-royal tea, every eight or ten hours till the symptoms abate. Ease, cheerfulness, and tranquility of mind, are here of the greatest importance. When a looseness proceeds from acrid or poisonous substances taken into the stomach, the patient must drink large quantities of diluting liquor,

with oil or fat broths, to promote vomiting and purging. Afterwards, if there be reason to suspect that the bowels are inflamed, bleeding will be necessary. Small doses of laudanum may likewise be taken to remove their irritation. From whatever cause a looseness proceeds, when it is found necessary to check it, the diet ought to consist of rice boiled with milk, and flavoured with cinnamon; rice-jelly; sago, with red port; and the lighter sorts of flesh-meat roasted. The drink may be thin water-gruel, rice-water, or weak broth made from lean veal, or with a sheep's head, as being more gelitanous than mutton, beef, or chicken broth.

OF VOMITING.

VOMITING may proceed from various causes; as excess in eating and drinking, foulness of the stomach, the acrimony of the aliments, or a translation of the morbific matter of ulcers, of the gout, the erysipelas, or other diseases, to the stomach and bowels.

CURE.—When vomiting proceeds from a foul stomach or indigestion, it is not to be considered as a disease, but as the cure of a disease. It ought therefore to be promoted by taking lukewarm water or thin gruel. If this does not put a stop to the vomiting, a dose of ipecacuanha may be taken, and worked off with weak camomile tea. If vomiting proceeds from weakness of the stomach, bitters will be of service. Peruvian bark infused in wine or brandy, with as much rhubarb as will keep the body gently open, is an excellent medicine in this case. The elixir of vitriol is also a good medicine; it may be taken in the dose of fifteen or twenty drops, twice or thrice a-day, in a glass of wine or water. Habitual vomitings are sometimes alleviated by making oysters a principal part of the diet. A vomiting which proceeds from acidities in the stomach, is relieved by alkaline purges. The best medicine of this kind is the magnesia alba,

a tea-spoonful of which may be taken in a dish of tea or a little milk, three or four times a-day, or oftener if necessary, to keep the body open. I have always found the saline draughts taken in the act of effervesence, of singular use in stopping a vomiting, from whatever cause it proceeded. These may be prepared by dissolving a drachm of salt of tartar in an ounce and a half of fresh lemon juice, and adding to it an ounce of peppermint-water, the same quantity of simple cinnamon water, and a little white sugar. This draught must be swallowed before the effervesence is quite over, and may be repeated every two hours, or oftener if the vomiting be violent.

OF THE DIABETES.

In a diabetes, the urine generally exceeds in quantity all the liquid food which the patient takes. It is thin and pale, of a sweetish taste, and an agreeable smell. The patient has a continual thirst with some degree of fever; his mouth is dry, and he spits frequently a frothy spittle. The strength fails, the appetite decays, and the flesh wastes away till the patient is reduced to skin and bone. There is a heat of the bowels; and frequently the loins, testicles, and feet are swelled.

Cure.—This disease may generally be cured at the beginning; but, after it has continued long, the cure becomes very difficult. Every thing that stimulates the uirnary passage, or tends to relax the habit, must be avoided. For this reason the patient should live chiefly on solid food. His thirst may be quenched with acids; as sorrel, juice of lemon, or vinegar. The mucilaginous vegetables, as rice, sago, and salop, with milk, are the most proper food. Of animal substances, shell-fish are to be preferred; as oysters, crabs, &c. The drink may be Bristol water, (a constant course of which has done wonders in this disorder, and is reckoned a specific;)when that cannot be obtained, lime water, in which a due propor-

tion of oak bark has been macerated, may be used. The patient ought daily to take exercise, but it should be so gentle as not to fatigue him. He should lie upon a hard bed or mattress. Nothing hurts the kidnies more than lying too soft. Gentle purges, if the patient be not too much weakened by the disease, have a good effect. They may consist of rhubarb, with cardanum seed, or any other spiceries, infused in wine, and may be taken in such quantity as to keep the body gently open. The patient must next have recourse to astringents and corroborants. Half a drachm of powder, made of equal parts of alum and the inspissated juice commonly called *Terra Japonica*, may be taken four times a-day, or oftener, if the stomach will bear it; otherwise, Peruvian bark steeped in red wine. Opiates are of service in this disease, even though the patient rest well. They take off spasms and irritation, and at the same time lessen the force of the circulation. Ten or twelve drops of liquid laudanum may be taken in a cup of the patient's drink three or four times a-day.

OF A SUPPRESSION OF URINE.

A SUPPRESSION of urine may proceed from various causes; as an inflammation of the kidnies or bladder, small stones or gravel lodging in the urinary passages, hard fæces lying in the rectum, pregnancy, a spasm, or contraction of the neck of the bladder, clotted blood in the bladder itself, a swelling of the hæmorrhoidal veins, &c.

CURE.—We would chiefly recommend, in all obstructions of urine, fomentations and evacuants. Bleeding, as far as the patient's strength will permit, is necessary, especially where there are symptoms of topical inflammation. Bleeding in this case not only abates the fever, by lessening the force of the circulation, but, by relaxing the solids, it takes off the spasm or stricture upon the vessels which occasioned the obstruction. After bleeding, fomentations must be

used. These may either consist of warm water alone or of decoctions of mild vegetables; as mallows, camomile flowers, and such other herbs as are recommended in the Herbal. Cloths dipped in these may either be applied to the part affected, or a large bladder filled with the decoction may be kept continually upon it. Persons subject to a suppression of urine ought to live very temperate. Their diet should be light, and their liquor diluting. They should avoid all acids and austere wines; should take sufficient exercise, lie hard, and avoid study and sedentary occupations.

OF THE GRAVEL AND STONE.

THE stone and gravel may be occasioned by high living; the use of strong astringent wines; a sedentary life; lying too hot, soft, or too much on the back; the constant use of water impregnated with earthy or stony particles; aliments of an astringent or windy nature, &c. It may likewise proceed from an hereditary disposition. Persons in the decline of life, and those who have been much afflicted with the gout or rheumatism, are most liable to it.

CURE.—Persons afflicted with the gravel or stone, should avoid aliments of a windy or heating nature, as salt meats, sour fruits, &c. The diet ought chiefly to consist of such things as tend to promote the secretion of urine, and to keep the body open. Artichokes, asparagus, spinage, lettuce, parsley, succory, purslane, turnips, potatoes, carrots, and radishes may be safely eaten. Onions, leeks, and celery, are, in this case, reckoned medicinal. The most proper drinks are whey, butter-milk, milk and water, barley water; decoctions or infusions of the roots of marshmallows, parsley, liquorice, or of other mild mucilaginous vegetables, as linseed, lime-tree buds or leaves, &c. If the patient has been accustomed to generous liquors, he may drink small gin-punch without acid. In what is called a fit of the gravel, which is com-

monly occasioned by a stone sticking in the ureter or some part of the urinary passages, the patient must be bled; warm fomentations should likewise be applied to the part affected, emollient clysters administered, and diluting mucilaginous liquors drunk, &c. The treatment in this case must be the same as pointed out for an inflammation of the kidnies and bladder, &c. Patients who are subject to frequent fits of gravel in the kidnies, but have no stone in the bladder, are advised to drink every morning, two or three hours before breakfast, an English pint of oyster or cockle shell lime-water; for though this quantity might be too small to have any sensible effect in dissolving a stone in the bladder, yet it may very probably prevent its growth. When a stone is formed in the bladder, Alicant soap, and oyster or cockle shell lime-water, may be taken in the following manner: The patient must swallow every day, in any form that is least disagreeable, an ounce of the internal part of Alicaut soap, and drink three or four English pints of oyster or cockle shell lime-water. The soap is to be divided into three doses; the largest to be taken fasting in the morning early; the second at noon; and the third at seven in the evening; drinking with each dose a large draught of the lime-water; the remainder of which he may take any time betwixt dinner and supper, instead of other liquors. The caustic alkali, or soap-lees, is the medicine chiefly in vogue at present for the stone. It may be prepared by mixing two parts of quick-lime with one of pot-ashes, and suffering them to stand till the lixivium be formed, which must be carefully filtrated before it be used. If the solution does not happen readily, a small quantity of water may be added to the mixture. The patient must begin with small doses of the lees, as thirty or forty drops, and increase by degrees as far as the stomach will bear it.

OF INVOLUNTARY DISCHARGES OF BLOOD.

INVOLUNTARY discharges of blood are so far from being always dangerous, that they prove often salutary. When such discharges are critical, which is frequently the case in fevers, they ought not to be stopped. Nor indeed is it proper at any time to stop them, unless they be so great as to endanger the patient's life. Most people, afraid of the smallest discharge of blood from any part of the body, fly immediately to the use of styptic, and astringent medicines, by which means an inflammation of the brain, or some other fatal disease, is occasioned, which, had the discharge been allowed to go on, might have been prevented. Periodical discharges of blood, from whatever part of the body they proceed, must not be stopped. They are always the efforts of nature to relieve herself; and fatal diseases have often been the consequences of obstructing them. It may indeed sometimes be necessary to check the violence of such discharges; but even this requires the greatest caution. In the early period of life, bleeding at the nose is very common. Those who are farther advanced in years are more liable to *hæmoptoe*, or discharge of blood from the lungs. After the middle period of life, hæmorrhoidal fluxes are most common; and, in the decline of life, discharges of blood from the urinary passages. Bleeding at the nose, to persons who abound with blood, is very salutary. It often cures a vertigo, the head-ache, a phrenzy, and even an epilepsy. In fevers, where there is a great determination of blood towards the head, it is of the utmost service. It is likewise beneficial in inflammations of the liver and spleen, and often in the gout and rheumatism. In all diseases where bleeding is necessary, a spontaneous discharge of blood from the nose is of much more service than the same quantity let with the lancet. Whenever bleeding at the nose relieves any bad symptom, and does not proceed so

far as to endanger the patient's life, it ought not to be stopped. But, when it returns frequently, or continues till the pulse becomes low, the extremities begin to grow cold, the lips pale, or the patient complains of being sick and faint, it must immediately be stopped.

CURE.—Let the patient be set nearly upright, with his head reclining a little, and his legs immersed in water about the warmth of new milk. His hands ought likewise to be put in lukewarm water, and his garters may be tied a little tighter than usual. Ligatures may be applied to the arms, about the place where they are usually made for bleeding, and with nearly the same degree of tightness. These must be gradually slackened as the blood begins to stop, and removed entirely as soon as it gives over. Sometimes dry lint put up the nostrils will stop the bleeding. When this does not succeed, dossils of lint dipped in strong spirits of wine may be put up the nostrils; or, if that cannot be had, they may be dipped in brandy. If the genitals be immersed for some time in cold water, it will generally stop a bleeding at the nose. I have seldom known this fail.

OF THE BLEEDING AND BLIND PILES.

A DISCHARGE of blood from the hæmorrhoidal vessels is called the *bleeding piles*. When the vessels only swell, and discharge no blood, but are exceeding painful, the disease is called the *blind piles*. The discharge however, is not always to be treated as a disease. It is even more salutary than bleeding at the nose, and often prevents or carries off diseases. It is peculiarly beneficial in the gout, rheumatism, asthma, and hypochondriacal complaints, and often proves critical in cholics and inflammatory fevers.

CURE.—In the management of the patient, regard must be had to his habit of body, his age, strength and manner of living. A discharge, which might be excessive and prove hurtful to one, may be very mo-

derate, and even salutary to another. That only is to be esteemed dangerous which continues too long, and in such quantity as to waste the patient's strength, hurt the digestion, nutrition, and other functions necessary to life. The Peruvian bark is proper in this case, both as a strengthener and astringent. Half a drachm of it may be taken in a glass of red wine, sharpened with a few drops of the elixir of vitriol, three or four times a-day. The bleeding piles are sometimes periodical, and return regularly once a-month, or once in three weeks. In this case they are always to be considered as a salutary discharge, and by no means to be stopped. In the blind piles, bleeding is generasly of use. The diet must be light and thin, and the drink cool and diluting. It is likewise necessary that the body be kept gently open. When the piles are exceeding painful and swelled, but discharge nothing, the patient must sit over the steam of warm water. He may likewise apply a linen cloth dipped in warm spirits of wine to the part, or poultices made of bread and milk, or of leeks fried with butter. If these do not produce a discharge, and the piles appear large, leeches must be applied as near them as possible, or, if they will fix upon the piles themselves, so much the better. When leeches will not fix, the piles may be opened with a lancet. The operation is very easy, and is attended with no danger. When the pain is very great, a liniment made of two ounces of emollient ointment, and half an ounce of liquid laudanum, beat up with the yolk of an egg, may be applied.

SPITTING OF BLOOD.

Persons of a slender make and a lax fibre, who have long necks and straight breasts, are most liable to this disease. It is most common in the spring, and generally attacks people before they arrive at the prime or middle period of life. It is a common observation, that those who have been subject to bleed-

ing at the nose when young are afterwards most liable to this complaint. It is often occasioned by excessive drinking, running, wrestling, singing, or speaking aloud. Such as have weak lungs ought to avoid all violent exertions of that organ, as they value life. They should likewise guard against violent passions, excessive drinking, and every thing that occasions a rapid circulation of the blood. It is often the effect of a long and violent cough; in which case it is generally the forerunner of a consumption. Spitting of blood is not always to be considered as a primary disease. It is often only a symptom, and in some diseases not an unfavourable one. This is the case in pleurisies, peripneumonies, and sundry other fevers. In a dropsy, scurvy, or consumption, it is a bad symptom, and shows that the lungs are ulcerated.

CURE.—This, like the other involuntary discharges of blood, ought not to be suddenly stopped by astringent medicines. It may however proceed so far as to weaken the patient, and even endanger his life, in which case proper means must be used for restraining it. The body should be kept gently open by laxative diet, as roasted apples, stewed prunes, and such like. If these should not have the desired effect, a tea-spoonful of the lenative electuary may be taken twice or thrice a day, as is found necessary. If the bleeding proves violent, ligatures may be applied to the extremities, as directed for a bleeding at the nose. If the patient be hot or feverish, bleeding and small doses of nitre will be of use; a scruple or half a drachm of nitre may be taken in a cup of his ordinary drink twice or thrice a-day. If stronger astringents be necessary, fifteen or twenty drops of the acid elixir of vitriol may be given in a glass of water three or four times a-day.

VOMITING OF BLOOD.

THIS disease often proceeds from an obstruction of the menses in women, and sometimes from the stopping of the hæmorrhoidal flux in men. It may be occasioned by any thing that greatly stimulates or wounds the stomach, as strong vomits or purges, acrid poisons, sharp or hard substances taken into the stomach, &c. It is often the effect of obstructions in the liver, the spleen, or some of the other viscera. It may likewise proceed from external violence, as blows or bruises, or from any of the causes which produce inflammation. In hysteric women, vomiting of blood is very common, but by no means a dangerous symptom.

CURE.—A great part of the danger in this disease arises from the extravasated blood lodged in the bowels, and becoming putrid, by which means a dysentery or putrid fever may be occasioned. The best way of preventing this, is to keep the body gently open, by frequently exhibiting emollient clysters. After the discharge is over, as the patient is generally troubled with gripes, occasioned by the acrimony of the blood lodged in the intestines, gentle purges will be necessary.

OF BLOODY URINE.

THIS discharge is more or less dangerous, according to the different circumstances which attend it. When pure blood is voided suddenly, without interruption and without pain, it proceeds from the kidnies; but if the blood be in small quantity, of a dark colour, and emitted with heat and pain about the bottom of the belly, it proceeds from the bladder. Bloody urine is always attended with some degree of danger; but it is peculiarly so when mixed with purulent matter, as this shows an ulcer somewhere in the urinary passages.

CURE.—When there is reason to suspect an ulcer

in the kidnies or the bladder, the patient's diet must be cool, and his drink of a soft, healing, balsamic quality, as decoctions of marsh-mallow roots with liquorice, solutions of gum-arabic, &c. Three ounces of marsh-mallow roots, and half an ounce of liquorice, may be boiled in two English quarts of water to one; two ounces of gum-arabic, and half an ounce of purified nitre, may be dissolved in the strained liquor, and a tea-cupful of it taken four or five times a-day. The early use of astringents in this disease has often bad consequences. When the flux is stopped too soon, the grumous blood, by being confined in the vessels, may produce inflammation, abcess, and ulcers. If however the case be urgent, or the patient seems to suffer from the loss of blood, gentle astringents may be necessary. In this case, the patient may take three or four ounces of lime-water, with half an aunce of the tincture of Peruvian bark, three times a-day.

OF THE DYSENTERY, OR BLOODY FLUX.

THIS disease is known by the flux of the belly, attended with violent pain of the bowels, a constant inclination to go to stool, and generally more or less blood in the stools. It begins, like other fevers, with chillness, loss of strength, a quick pulse, great thirst, and an inclination to vomit. The stools are at first greasy or frothy, afterwards they are streaked with blood, and, at last, have frequently the appearance of pure blood, mixed with small filaments, resembling bits of skin.

CURE.—Nothing is of more importance in this disease than cleanliness. It contributes greatly to the recovery of the patient, and no less to the safety of such as attend him. Every thing about the patient should be frequently changed. The excrements should never be suffered to continue in his chamber, but should be removed immediately, and buried under ground. A constant stream of fresh air should be admitted into

the chamber; and it ought frequently to be sprinkled with vinegar, juice of lemon, or some other strong acid. At the beginning of this disease it is always necessary to cleanse the first passages; for this purpose a vomit of ipecacuanha must be given, and worked off with camomile tea. Strong vomits are seldom necessary here; a scruple, or at most half a drachm, of ipecacuanha, is generally sufficient for an adult, and sometimes a very few grains will suffice. The day after the vomit, half a drachm, or two scruples, of rhubarb, must be taken; or, what will answer the purpose rather better, an ounce or an ounce and a half of Epsom salts; this dose may be repeated every other day for two or three times. Afterwards small doses of ipecacuanha may be taken for some time; two or three grains of the powder may be mixed in a table-spoonful of the syrup of poppies, and taken three times a-day. These evacuations will often be sufficient to effect a cure. Should it happen otherwise, the following astringent medicine may be used; A clyster of starch or fat mutton broth, with thirty or forty drops of liquid laudanum in it, may be administered twice a-day; at the same time an ounce of gum-arabic, and half an ounce of gum-tragacanth, may be dissolved in an English pint of barley-water, over a slow fire, and a table-spoonful of it taken every hour. When dysenteries prevail, we would recommend a strict attention to cleanliness, a spare use of animal food, and the free use of sound ripe fruits and other vegetables. We would also advise such as are liable to them to take either a vomit or a purge every spring or autumn, as a preservative.

OF THE JAUNDICE.

THE immediate cause of the jaundice is an obstruction of the bile. The patient at first complains of excessive weariness, and has great aversion to every kind of motion. His skin is dry, and he generally feels a kind of itching or pricking pain over the whole

body. If the patient be young, and the disease complicated with no other malady, it is seldom dangerous; but in old people, where it continues long, returns frequently, or is complicated with the dropsy or hypochondriac symptoms, it generally proves fatal. The black jaundice is more dangerous than the yellow.

CURE.—The patient should take as much exercise as he can bear, either on horseback, or in a carriage; walking, running, and even jumping, are likewise proper, provided he can bear them without pain, and there be no symptoms of inflammation. Patients have been often cured of this disease by a long journey, after medicines had proved ineffectual. If the patient be young, of a full sanguine habit, and complains of pain in the right side about the region of the liver, bleeding will be necessary. After this a vomit must be administered, and, if the disease proves obstinate, it may be repeated once or twice. No medicines are more beneficial in the jaundice than vomits, especially where it is not attended with inflammation; half a drachm of ipecacuanha in powder will be a sufficient dose for an adult; it may be worked off with weak camomile-tea, or lukewarm water. Fomenting the parts about the region of the stomach and liver, and rubbing them with a warm hand or flesh-brush, are likewise beneficial; but it is still more so for the patient to sit in a bath of warm water up to the breast. He ought to do this frequently, and should continue in it as long as his strength will permit. Numberless British herbs are certain cures for this disease, as may be seen in the Herbal. I have known considerable benefit, in a very obstinate jaundice, from a decoction of hempseed: four ounces of the seed may be boiled in two English quarts of ale, and sweetened with coarse sugar; the dose half a pint every morning, and may be continued for eight or nine days. A very obstinate jaundice has been cured by swallowing raw eggs. Persons subject to

the jaundice ought to take as much exercise as possible, and to avoid all heating and astringent aliments. If it attacks maidens after the age of puberty marriage is a certain cure.

OF THE DROPSY.

THE dropsy is often owing to an hereditary disposition, and often to a jaundice badly cured; it may likewise proceed from drinking ardent spirits, or other strong liquors. It is true almost to a proverb, that great drinkers die of a dropsy. The want of exercise is also a very common cause of the dropsy; hence it is justly reckoned among the diseases of the sedentary. It often proceeds from excessive evacuations, as frequent and copious bleedings, strong purges often repeated, frequent salivations, &c. The sudden stoppage of cnstomary or necessary evacuations, as the menses, the hæmorrhoids, fluxes of the belly, and, in short, whatever obstructs the perspiration, or prevents the blood from being duly prepared, occasions a dropsy. It generally begins with a swelling of the feet and ancles towards night, which for some time, dissapppears in the morning. In the evening the parts, if pressed with the finger, will pit. The swelling gradually ascends, and occupies the trunk of the body, the arms, and the head. Afterwards the breathing becomes difficult, the urine is in small quantity, and the thirst great; the body is bound, and the perspiration is greatly obstructed. To these succeed torpor, heaviness, a slow wasting fever, and a troublesome cough. This last is generally a fatal symptom, as it shows that the lungs are affected. When the disease comes suddenly on, and the patient is young and strong, there is reason to hope for a cure, especially if the medicine be given early. But, if the patient be old, has led an irregular or sedentary life, or if there be reason to suspect that the liver, lungs, or any of the viscera, are unsound, there is great ground to fear that the consequences will prove fatal.

CURE.—The patient must abstain, as much as possible, from all drink, especially weak and watery liquors, and must quench his thirst with mustard whey, or acids, as juice of lemons, oranges, sorrel, or such like. His aliment ought to be dry, of a stimulating and diuretic quality, as toasted bread, the flesh of birds, or other wild animals, roasted; pungent and aromatic vegetables, as garlic, mustard, onions, cresses, horse-radish, rocambole, shalot, &c. He may also eat sea-biscuit dipt in wine or a little brandy. This is not only nourishing, but tends to quench thirst. Some have been actually cured of a dropsy by a total abstinence from all liquids, and living entirely upon such things as are mentioned above. If the patient must have drink, the Spa water, or Rhenish wine, with diuretic medicines infused in it, are the best. Exercise is of the greatest importance in a dropsy. If the patient be able to walk, dig, or the like, he ought to continue these exercises as long as he can. If he is not able to walk or labour, he must ride on horseback, or in a carriage, and the more violent the motion, so much the better, provided he can bear it. If the disease has come on suddenly, it may generallp be removed by strong vomits, brisk purges, and such medicines as promote a discharge by sweat and urine. For an adult, half a drachm of ipecacuanha in powder, and half an ounce of oxymel of squills, will be a proper vomit. This may be repeated as often as is found necessary, three or four days intervening between the doses. The patient must not drink much after taking the vomit, otherwise he destroys its effect. A cup or two of camomile-tea will be sufficient to work it off. Betwixt each vomit, on one of the intermediate days, the patient may take the following purge: Jalap in powder, half a drachm, cream of tartar two drachms, calomel six grains. These may be made into a bolus with a little syrup of pale roses, and taken early in the morning. The less the patient drinks after it the better. If he be much griped,

he may take now and then a cup of chicken-broth. The patient may likewise take every night at bed-time the following bolus; To four or five grains of camphor add one grain of opium, and as much syrup of orange-peel as is sufficient to make them into a bolus. This will generally promote a gentle sweat, which should be encouraged by drinking now and then a small cup of white wine whey, with a tea-spoonful of the spirits of hartshorn in it. A tea-cup-ful of the following diuretic infusion may likewise be taken every four or five hours through the day: Take juniper berries, mustard-seed, and horse-radish, of each half an ounce, ashes of broom half a pound; infuse them in a quart of Rhenish wine or strong ale for a few days, and afterwards strain off the liquor. Such as cannot take this infusion, may use the de-coction of senaka-root, which is both diuretic and sudorific. I have known an obstinate *anasarca* cured by an infusion of the ashes of broom in wine. The above course will often cure an incidental dropsy, if the constitution be good; but, when the disease pro-ceeds from a bad habit, or an unsound state of the viscera, strong purges and vomits are not to be ven-tured upon. In this case, the safer course is to pal-liate the symptoms by the use of such medicines as promote the secretions, and to support the patient's strength by warm and nourishing cordials. The se-cretion of urine may be greatly promoted by nitre. Brookes says, he knew a young woman who was cured of a dropsy by taking a drachm of nitre every morning in a draught of ale, after she had been given over as incurable; and a large spoonful of unbruised mustard-seed taken every night and morning, and drinking half a pint of the decoction of the tops of green broom after it, has performed cures when other powerful medicines have proved ineffectual. When the disease does not evidently and speedily give way to purgative and diuretic medicines, the water ought to be let off by tapping. This is a very simple and

safe operation, and would often succeed if it were performed in due time; but, if it be delayed till the humours are vitiated, or the bowels spoiled by long soaking in water, it can hardly be expected that any permanent relief will be procured. After the evacuation of the water, the patient is to be put on a course of strengthening medicines; as the Peruvian bark, the elixir of vitriol, warm aromatics, with a due proportion of rhubarb infused with wine, and such like.

OF THE GOUT.

THERE is no disease which shows the imperfection of medicine, or sets the advantage of temperance and exercise in a stronger light, than the gout. Excess and idleness are the true sources from whence it originally sprang, and all who would avoid it must be active and temperate. As there are no medicines yet known that will cure the gout, we shall confine our observations chiefly to regimen, both in and out of the fit. In the fit, if the patient be young and strong, his diet ought to be thin and cooling, and his drink of a diluting nature; but where the constitution is weak, and the patient has been accustomed to live high, this is not a proper time to retrench. In this case he must be kept nearly to his usual diet, and should take frequently a cup of strong negus, or a glass of generous wine. Wine-whey is a very proper drink in this case, as it promotes the perspiration without greatly heating the patient. It will answer this purpose better if a tea-spoonful of *sal volatile oleosum*, or spirits of hartshorn be put into a cup of it twice a-day. It will likewise be proper to give at bed-time a tea-spoonful of the volatile tincture of *guaiacum* in a large draught of warm wine-whey. This will greatly promote perspiration through the night. As the most safe and efficatious method of discharging the gouty matter is by perspiration, this ought to be kept up by all means, especially in the affected part. For this purpose the leg and foot

should be wrapped in soft flannel, fur, or wool. The last is most readily obtained, and seems to answer the purpose better than any thing else. The people of Lancashire look upon wool as a kind of specific of the gout. They wrap a great quantity of it about the leg and foot affected, and cover it with a skin of soft dressed leather. The wool which they use is generally greased, and carded or combed. They choose the softest which can be had, and seldom or never remove it till the fit be entirely gone off. All external applications that repel the matter are to be avoided as death. They do not cure the disease, but remove it from a safer to a more dangerous part of the body, where it often proves fatal. Many things will shorten a fit of the gout, and some will drive it off altogether; but nothing has yet been found which will do this with safety to the patient. In pain we eagerly grasp at any thing that promises immediate ease, and even hazard life itself for a temporary relief. This is the true reason why so many infallible remedies have been proposed for the gout, and why such numbers have lost their lives by the use of them. It would be as imprudent to stop the small-pox from rising, and to drive it into the blood, as to attempt to repel the gouty matter after it has been thrown upon the extremities. The latter is as much an effort of nature to free herself from an offending cause as the former, and ought equally to be promoted. When the pain however is very great, and the patient is restless, thirty or forty drops of laudanum, more or less, according to the violence of the symptoms, may be taken at bed-time. This will ease the pain, procure rest, promote perspiration, and forward the crisis of the disease. Though it may be dangerous to stop a fit of the gout by medicine, yet if the constitution can be so changed by diet and exercise, as to lessen or totally prevent its return, there certainly can be no danger in following such a course. It is well known that the whole habit may be so altered

by a proper regimen, as nearly to eradicate this disease; and those only who have sufficient resolution to persist in such a course, have reason to expect a cure. The course which we would recommend for preventing the gout, is as follows; in the first place, universal temperance; in the next, sufficient exercise. By this we no not mean sauntering about in an indolent manner; but labour, sweat and toil. These only can render the humours wholesome, and keep them so. Going early to bed, and rising betimes, are also of great importance. When the gout attacks the head or lungs, every method must be taken to fix it in the feet. They must be frequently bathed in warm water, and acrid cataplasms applied to the soles. Blisters ought likewise to be applied to the ancles or calves of the legs. Bleeding in the feet or ancles is also necessary, and warm stomachic purges. The patient ought to keep in bed for the most part, if there be any signs of inflammation, and should be very careful not to catch cold. If it attacks the stomach with a sense of cold, the most warm cordials are necessary; as strong wine boiled up with cinnamon and other spices, cinnamon-water, peppermint-water, and even brandy or rum. The patient should keep his bed, and endeavour to promote a sweat by drinking warm liquors; and, if he should be troubled with nausea, or inclination to vomit, he may drink camomile tea, or any thing that will make him vomit freely. Those who never had the gout, but who, from their constitution or manner of living, have reason to expect it, ought likewise to be very circumspect with regard to its first approach. If the disease, by wrong conduct or improper medicines, be diverted from its proper course, the miserable patient has a chance to be ever after tormented with head-aches, coughs, pains of the stomach and intestines; and to fall, at last, a victim to its attack upon some of the more noble parts.

OF THE RHEUMATISM.

THE causes of a rheumatism are frequently the same as those of an inflammatory fever ; viz. an obstructed perspiration, the immoderate use of strong liquors, and the like. Sudden changes of the weather, and all quick transitions from heat to cold, are very apt to occasion the rheumstism. The acute rheumatism commonly begins with weariness, shivering, a quick pulse, restlessness, thirst, and other symptoms of fever. Afterwards the patient complains of flying pains, which are increased by the least motion. These at length fix in the joints, which are often affected with swelling and inflammation. If blood be let in this disease it has generally the same appearance as in the pleurisy. In this kind of rheumatism the treatment of the patient is nearly the same as in an acute or inflammatory fever. If he be young and strong, bleeding is necessary, which may be repeated according to the exigencies of the case. The body ought likewise to be kept open by emollient clysters, or cool opening liquors: as decoctions of tamarinds, cream of tartar, whey, senna-tea, and the like. Warm bathing, after proper evacuations, has often an exceeding good effect. The patient may either be put into a bath of warm water, or have cloths wrung out of it applied to the part affected. Great care must be taken that he do not catch cold after bathing. The chronic rheumatism is seldom attended with any considerable degree of fever, and is generally confined to some particular part of the body, as the shoulders, the back, or the loins. There is seldom any inflammation or swelling in this case. Persons in the decline of life are most subject to the chronic rheumatism. In such patients it often proves extremely obstinate, and sometimes incurable. Though this disease may not seem to yield to medicines for some time, yet they ought to be persisted in. Persons who are subject to frequent returns of

the rheumatism, will often find their account in using medicines, whether they be immediately affected with the disease or not. The chronic rheumatism is similar to the gout in this respect, that the most proper time for using medicines to extirpate it, is when the patient is most free from the disorder. There are several of our plants pointed out in the Herbal which may be used with great advantage in the rheumatism. One of the best is the white mustard; a table spoonful of the seed of this plant may be taken twice or thrice a-day, in a glass of water or small wine. The water-trefoil is likewise of great use in this complaint; it may be infused in wine or ale, or drunk in the form of tea. The ground-ivy, camomile, and several other bitters, are also beneficial, and may be used in the same manner. No benefit is however to be expected from these, unless they be taken for a considerable time. Excellent medicines are often despised in this disease because they do not perform an immediate cure; whereas nothing would be more certain than their effect, were they duly persisted in. Want of perseverance in the use of medicines is one reason why chronic diseases are so seldom cured. Cold bathing, especially in salt water, often cures the rheumatism. We would also recommend riding on horseback, and wearing flannel next the skin. Issues are likewise very proper, especially in chronic cases. If the pain affects the shoulders, an issue may be made in the arm; but, if it affects the loins, it should be put in the leg or thigh.

OF THE SCURVY.

THE scurvy is occasioned by cold moist air; by the long use of salted or smoke-dried provisions, or any kind of food that is hard of digestion, and affords little nourishment. It may also proceed from a suppression of customary evacuations, as the menses, the hæmorrhoidal flux, &c. It is sometimes owing to an hereditary taint, in which case a very small cause

will excite the latent disorder. Grief, fear, and other depressing passions, have a great tendency both to excite and aggravate this disease. The same observation holds with regard to neglect of cleanliness, bad clothing, the want of proper exercise, confined air, unwholesome food, or any disease which greatly weakens the body, or vitiates the humours.

CURE.—There is no way of curing this disease so effectually, as by pursuing a plan directly opposite to that which brings it on. It proceeds from a vitiated state of the humours, occasioned by errors in diet, air or exercise; and this cannot be removed but by a proper attention to these important articles. When the scurvy has been brought on by a long use of salted provisions, the proper medicine is a diet consisting chiefly of fresh vegetables; as oranges, apples, lemons, tamarinds, water cresses, scurvy-grass, brook-lime, &c. The use of these with milk, pot-herbs, new bread, and fresh beer or cider, will seldom fail to remove a scurv of this kind, if taken before it be too far advanced; but to have this effect, they must be persisted in for a considerable time. I have often seen very extraordinary effects in the land-scurvy from a milk diet. This preparation of nature is a mixture of animal and vegetable properties, which of all others is the most fit for restoring a decayed constitution, and removing that particular acrimony of the humours, which seems to constitute the very essence of the scurvy and many other diseases. But people despise this wholesome and nourishing food, because it is cheap, and devour with greediness flesh and fermented liquors, while milk is only deemed fit for their hogs. The most proper drink in the scurvy is whey or butter-milk. When these cannot be had, sound cider, perry, or spruce beer, may be used. Wort has likewise been found to be a proper drink in the scurvy and may be used at sea, as malt will keep during the longest voyage. A decoction of the tops of the spruce fir is

likewise proper; it may be drunk in the quantity of an English pint twice a-day. Tar-water may be used for the same purpose, or decoctions of any of the mlld mucilaginous vegetables; sarsaparilla, marsh-mallow-roots, &c. Infusions of the bitter plants, as ground-ivy, the smaller centaury, marsh-trefoil, &c. are likewise beneficial. The peasants, in some parts of Britian, express the juice of the last mentioned plant, and drink it with good effect in those foul scorbutic eruptions with which they are often troubled in the spring season.

OF THE SCROPHULA OR KING'S EVIL.

THIS disease proceeds often from an hereditary taint, from a scrophulous nurse, &c. Children who have the misfortune to be born of sickly parents, whose constitutions have been greatly injured by chronic diseases, are apt to be affected with the scrophula. It may likewise proceed from such diseases as weaken the habit or vitiate the humours, as the small-pox, the measles, &c. At first small knots appear under the chin or behind the ears, which gradually increase in number and size, till they form one large hard tumour. This often continues for a long time without breaking, and, when it does break, it only discharges a thin watery humour. Other parts of the body are likewise liable to its attack, as the arm-pits, groins, feet, hands, eyes, breast, &c. The white swellings of the joints seem likewise to be of this kind. They are with difficulty brought to a suppuration, and, when opened, they only discharge a thin ichor. There is not a more general symptom of the scrophula than a swelling of the upper lip and nose.

CURE.—In this complaint medicine is but of little use. It has been found, that keeping the body gently open for some time with sea-water, has a good effect. Bathing in salt water, and drinking it in such quantities as to keep the body gently open, will cure a

scrophula, when medicines have been tried in vain. When salt water cannot be obtained, the patient may be bathed in fresh water, and his body kept open by small quantities of salt and water, or some other mild purgative. Next to cold bathing, and drinking the salt water, we would recommend the Peruvian bark. The cold bath may be used in summer, and the bark in winter. To an adult half a drachm of the bark in powder may be given, in a glass of red wine, four or five times a day. Hemlock may sometimes be used with advantage in the scrophula. Some lay it down as a general rule, that the sea-water is most proper before there are any suppuration or symptoms of tabes; the Peruvian bark, when there are running sores, and a degree of hectic fever; and the hemlock in old inveterate cases, approaching to the schirrhous or cancerous state. Either the extract or the fresh juice of this plant may be used. The dose must be small at first, and increased gradually as far as the stomach is able to bear it.

OF THE ITCH

THE itch is seldom a dangerous disease, unless when it is rendered so by neglect or improper treatment. If it be suffered to continue too long, it may vitiate the whole mass of humours; and if it be suddenly thrown in, without proper evacuations, it may occasion fevers, inflammations of the viscera, or other internal disorders.

CURE.—The best medicine yet known for the itch is sulphur, which ought to be used both externally and internally. The parts most affected may be rubbed with an ointment made of the flour of sulphur, two ounces; crude sal ammoniac, finely powdered, two drachms; hog's lard, or butter, four ounces. If a scruple or half a drachm of the essence of lemon be added, it will entirely take away the disagreeable smell. About the bulk of a nutmeg of this may be rubbed upon the extremities, at bed-time, twice or

thrice a week. It is seldom necessary to rub the whole body; but, when it is, it ought not to be done all at once, but by turns, as it is dangerous to stop too many pores at the same time. Before the patient begins to use the ointment, he ought, if he be of a full habit, to bleed or take a purge or two. It will likewise be proper, during the use of it, to take every night and morning as much of the flour of brimstone and cream of tartar, in a little treacle or new milk, as will keep the body gently open. I never knew brimstone, when used as directed above, fail to cure the itch; and I have reason to believe, that, if duly persisted in, it never will fail; but, if it be only used once or twice, and cleanliness be neglected, it is no wonder if the disorder returns. The quantity of ointment mentioned above will generally be sufficient for the cure of one person; but, if any symptoms of the disease should appear again, the medicine may be repeated. It is both more safe and efficacious when persisted in for a considerable time, than when a large quantity is applied at once. As most people dislike the smell of sulphur, they may use in its place the powder of white hellebore root made up into an ointment, in the same manner, which will seldom fail to cure the itch. People ought to be extremely cautious lest they take other eruptions for the itch; as the stoppage of these may be attended with fatal consequences. Many of the eruptive disorders to which children are liable, have a near resemblance to this disease; and I have often known infants killed by being rubbed with greasy ointments, that made these eruptions strike suddenly in, which nature had thrown out to preserve the patient's life, or prevent some other malady.

OF THE ASTHMA.

THE asthma is a disease of the lungs, which seldom admits of a cure. Persons in the decline of life are most liable to it. It is distinguished into the moist

and dry, or humoral and nervous. The former is attended with expectoration or spitting; but in the latter the patient seldom spits, unless sometimes a little tough phlegm by the mere force of coughing. An asthma is known by a quick laborious breathing, which is generally performed with a kind of wheezing noise. Sometimes the difficulty of breathing is so great, that the patient is obliged to keep in an erect posture, otherwise he is in danger of being suffocated. A fit or paroxysm of the asthma generally happens after a person has been exposed to cold easterly winds, or has been abroad in thick foggy weather, or has got wet, or continued long in a damp place under ground, &c.

CURE.—All windy food, and whatever is apt to swell in the stomach, is to be avoided. Strong liquors of all kinds, especially malt liquor, are hurtful. The patient should eat a very light supper, or rather none at all, and should never suffer himself to be long costive. His clothing should be warm, especially in the winter-season. As all disorders of the breast are much relieved by keeping the feet warm, and promoting the perspiration, a flannel shirt or waistcoat, and thick shoes, will be of singular service. But nothing is of so great importance in the asthma, as pure and moderately warm air. Many asthmatic persons, who cannot live in Britain, enjoy very good health in the south of France, Portugal, Spain, or Italy. Exercise is likewise of very great importance in the asthma, as it promotes the digestion, preparation of the blood, &c The blood of asthmatic persons is seldom duly prepared, owing to the proper action of the lungs being impeded. For this reason such people ought daily to take as much exercise, either on foot, on horseback, or in a carriage, as they can bear. Almost all that can be done by medicine in this disease, is to relieve the patient when seized with a violent fit. Bleeding, unless extreme weakness or old age should forbid it, is highly proper. If there be a violent spasm about

the breast or stomach, warm fomentations, or bladders filled with warm milk and water, may be applied to the part affected, and warm cataplasms to the soles of the feet. The patient must drink freely of diluting liquors, and may take a tea-spoonful of the tincture of castor and of saffron mixed together, in a cup of valerian tea, twice or thrice a day. Sometimes a vomit has a very good effect, and snatches the patient, as it were, from the jaws of death. This, however, will be more safe after other evacuations have been premised. A very strong infusion of roasted coffee is said to give ease in an asthmatic paroxysm. In the moist asthma, such things as promote expectoration or spitting ought to be used; as the syrup of squills, gum-ammoniac, and such like. A common spoonful of the syrup of oxymel of squills, mixed with an equal quantity of cinnamon-water, may be taken three or four times through the day; and four or five pills, made of equal parts of assafœtida and gum-ammoniac, at bed-time. Large doses of æther have been found very efficacious in removing a fit of the asthma. For the convulsive or nervous asthma, antispasmodics and bracers are the most proper medicines. The patient may take a tea-spoonful of the paregoric elixir twice a day. The Peruvian bark is sometimes found to be of use in this case. It may be taken in substance, or infused in wine. In short, everything that braces the nerves, or takes off spasm, may be of use in a nervous asthma. It is often relieved by the use of asses' milk; I have likewise known cow's milk drunk warm in the morning have a good effect in this case. In every species of asthma, setons and issues are of great service; they may either be put in the back or side, and should never be allowed to dry up. We shall here, once for all, observe, that not only in the asthma, but in most chronic diseases, issues are extremely proper. They are both a safe and an efficacious remedy; and, though they do not always cure the disease, yet they will often prolong the patient's life.

OF THE APOPLEXY.

THE immediate cause of an apoplexy is a compression of the brain, occasioned by an excess of blood, or a collection of watery humours. The former is called a *sanguine*, and the latter a *serous*, apoplexy. It may be occasioned by any thing that increases the circulation towards the brain, or prevents the return of the blood from the head; intense study, violent passions, suppression of urine, excess of venery, the sudden striking-in of any eruption, wounds or bruises on the head, long exposure to excessive cold, poisonous exhalations, &c.

CURE.—The usual forerunners of an apoplexy are giddiness, pain and swimming of the head, loss of memory, drowsiness, noise in the ears, the night-mare, a spontaneous flux of tears, and laborious respiration. When persons have reason to fear the approach of a fit, they should endeavour to prevent it by bleeding, a slender diet, and opening medicines. In the apoplexy, if the patient does not die suddenly, the countenance appears florid, the face is swelled or puffed up, and the blood-vessels, especially about the neck and temples, are turgid; the pulse beats strong, the eyes are prominent and fixed, and the breathing is difficult, and performed with a snorting noise. The excrements and urine are often voided spontaneously, and the patient is sometimes seized with vomiting. In this stage, every method must be taken to lessen the force of the circulation towards the head. The garters should be tied pretty tight, by which means the motion of the blood from the lower extremities will be retarded. The patient should be bled freely in the neck or arm, and, if there be occasion, the operation may be repeated in two or three hours. A laxative clyster, with plenty of sweet oil, or fresh butter, and a spoonful or two of common salt in it, may be administered every two hours; and blistering plasters applied betwixt the shoulders and to the calves of the legs. As soon

as the symptoms are a little abated, and the patient is able to swallow, he ought to drink freely of some diluting opening liquors, as a decoction of tamarinds and liquorice, cream-tartar whey, or common whey with cream of tartar dissolved in it. Or he may take any cooling purge, as Glauber's salts, manna dissolved in an infusion of senna, or the like. All spirits and other strong liquors are to be avoided. Even volatile salts held to the nose do mischief. Vomits, for the same reason, ought not to be given, nor any thing that may increase the motion of the blood toward the head. When apoplectic symptoms proceed from opium, or other narcotic substances taken into the stomach, vomits are necessary. The patient is generally relieved as soon as he has discharged the poison in this way.

OF THE HEART-BURN.

WHAT is commonly called the heart-burn is not a disease of that organ, but an uneasy sensation of heat or acrimony about the pit of the stomach, which is sometimes attended with anxiety, nausea, and vomiting. When the heart-burn proceeds from debility of the stomach or indigestion, the patient ought to take a dose or two of rhubarb; afterwards he may use infusions of the Peruvian bark, or any other of the stomachic bitters, in wine or brandy. Exercise in the open air will likewise be of use, and every thing that promotes digestion. When bilious humours occasion the heart-burn, a tea-spoonful of the sweet spirit of nitre in a glass of water, or a cup of tea, will generally give ease. If it prcoeeds from the use of greasy aliments, a dram of brandy or rum may be taken. If acidity or sourness of the stomach occasions the heart-burn, absorbents are the proper medicines. In this case, an ounce of powdered chalk, half an ounce of fine sugar, and a quarter of an ounce of gum-arabic, may be mixed in an English quart of water, and a tea-cupful of it taken as is necessary. But the safest

and best absorbent is magnesia alba. This not only acts as an absorbent, but likewise as a purgative; whereas chalk, and other absorbents of that kind, are apt to lie in the intestines, and occasion obstructions. If wind be the cause of this complaint, the most proper medicines are those called carminatives; as aniseeds, juniper-berries, ginger, canella alba, cardamom-seeds, &c. These may either be chewed, or infused in wine, brandy, or other spirits. I have frequently known the heart-burn cured, particularly in pregnant women, by chewing green tea.

OF NERVOUS DISEASES.

NERVOUS diseases not only affect the body, but the mind likewise suffers, and is often thereby rendered extremely weak and peevish. The low spirits, timorousness, melancholy, and fickleness of temper, which generally attend nervous disorders, induce many to believe, that they are entirely diseases of the mind; but this change of temper is rather a consequence, than the cause, of the disease. Every thing that tends to relax or weaken the body disposes it to nervous diseases, as indolence, excessive venery, drinking too much tea, or other weak watery liquors, frequent bleeding, purging, vomiting, &c.

CURE.—Persons afflicted with nervous diseases ought never to fast long. Their food should be solid and nourishing, but of easy digestion. Fat meats, and high sauces, are hurtful. All excess should be carefully avoided. They ought never to eat more at a time than they can easily digest; but, if they feel themselves weak and faint between meals, they ought to eat a bit of bread and drink a glass of wine. Heavy suppers are to be avoided. Though wine in excess enfeebles the body and impairs the faculties of the mind, yet taken in moderation, it strengthens the stomach and promotes digestion. Exercise in nervous disorders is superior to all medicines. Even change of place, and the sight of new objects, by di-

verting the mind, have a great tendency to remove these complaints. For this reason a long journey or a voyage, is of much more advantage than riding short journeys near home. Though nervous diseases are seldom radically cured, yet their symptoms may sometimes be alleviated, and the patient's life rendered at least more comfortable, by proper medicines. When digestion is bad, and the stomach relaxed and weak, the following infusion of Peruvian bark and other bitters may be used with advantage: Take of Peruvian bark an ounce, gentian-root, orange-peel, and coriander-seed, of each half an ounce; let these ingredients be all bruised in a mortar, and infused in a bottle of brandy or whiskey for the space of five or six days. A table-spoonful of the strained liquor may be taken in half a glass of water, an hour before breakfast, dinner, and supper. Few things tend more to strengthen the nervous system than cold bathing. This practice if duly persisted in, will produce very extraordinary effects: but, when the liver or other viscera are obstructed or otherwise unsound, the cold bath is improper. It is therefore to be used with very great caution. The most proper seasons for it are summer and autumn. It will be sufficient, especially for persons of a spare habit, to go into the cold bath three or four times a week. If the patient be weakened by it, or feels chilly for a long time after coming out, it is improper. Opiates are generally extolled in these maladies; but as they only palliate the symptoms, and generally afterwards increase the disease, we would advise people to be extremely sparing in the use of them, lest habit render them at last absolutely necessary. Whoever wishes for a thorough cure of this disease, should pay the strictest attention to diet, air, exercise, and amusement.

OF THE PALSY.

THE palsy is a loss or diminution of sense or motion, or of both, in one or more parts of the body. Of all

the affections called nervous, this is the most suddenly fatal. The immediate cause of the palsy is any thing that prevents the regular exertion of the nervous power, upon any particular muscle or part of the body. The occasional and predisposing causes are various, as drunkenness, wounds of the brain or spinal marrow, pressure apon the brain or nerves, very cold or damp air, the suppression of customary evacuations, sudden fear, want of exercise, or whatever greatly relaxes the system.

CURE.—In young persons of a full habit, the palsy must be treated in the same manner as the apoplexy. The patient must be bled, blistered, and have his body opened by sharp clysters or purgative medicine. But, in old age, or when the disease proceeds from relaxation or debility, which is generally the case, a quite contrary course must be pursued. The diet must be warm and invigorating seasoned with spicy aromatic vegetables, as mustard, horse-radish, &c. The drink may be generous wine, mustard-whey, or brandy and water. Friction with the flesh-brush, or warm hand, is extremely proper, especially on the parts affected. Blisters may likewise be applied to the affected parts with advantage. One of the best external applications is electricity. The shocks should be received on the part affected; and they ought daily to be repeated for several weeks. Vomits are very beneficial in this kind of palsy, and ought frequently to be administered. The wild valerian-root is a very proper medicine in this case. It may either be taken in an infusion with sage-leaves, or half a drachm of it in powder may be given in a glass of wine three times a-day. If the patient cannot use the valerian, he may take of *sal volatile oleosum*, compound spirit of lavender, and tincture of castor, each half an ounce; mix these together, and take forty or fifty drops in a glass of wine three or four times a-day. A table spoonful of mustard-seed taken frequently, is a very good medicine. The pa-

tient ought likewise to chew cinnamon-bark, ginger, or other warm spiceries. Exercise is of the utmost importance in the palsy; but the patient must beware of cold, damp, and moist air. He ought to wear flannel next his skin; and, if possible, should remove into a warmer climate.

OF THE EPILEPSY, OR FALLING SICKNESS.

THE epilepsy is a sudden deprivation of all the senses, wherein the patient falls suddenly down, and is affected with violent convulsive motions. It is sometimes hereditary. It may likewise proceed from frights of the mother when with child; from blows, bruises, or wounds on the head; a collection of water, blood, or serous humours, in the brain; a polypus, tumours or concretions within the skull; excessive drinking, intense study, excess of venery, worms, teething, suppression of customary evacuations, too great emptiness or repletion; violent passions or affections of the mind, as fear, joy, &c.: hysteric affections, contagion received into the body, as the infection of the small-pox, measles, &c. In an epileptic fit, the patient generally makes an unusual noise; his thumbs are drawn in towards the palms of his hands, his eyes are distorted, he starts and foams at the mouth, his extremeties are bent, or twisted various ways, he often discharges his seed, urine, and fæces, involuntarily, and is quite destitute of all reason. After the fit is over, his senses gradually return, and he complains of a kind of stupor, weariness, and pain of his head; but has no remembrance of what happened to him during the fit.

CURE.—If the patient be of a sanguine temperament, and there be reason to fear an obstruction of the brain, bleeding and other evacuations will be necessary. When the disease is occasioned by the stoppage of customary evacuations, these, if possible,

must be restored; if this cannot be done, others may be substituted in their place. Issues or setons, in this case, have often a very good effect. When there is reason to believe that the disease proceeds from worms, proper medicines must be used to kill, or carry off, these vermin When the disease is from teething, the body should be kept open by emollient clysters, the feet frequently bathed in warm water, and, if the fits prove obstinate, a blister may be put betwixt the shoulders. The same method is to be followed, when epileptic fits precede the eruption of the small-pox, or measles, &c. The flowers of zinc have of late been highly extolled for the cure of the epilepsy. Though this medicine will not be found to answer the expectations which have been raised concerning it, yet in obstinate epileptic cases it deserves a trial. The dose is from one to three or four grains, which may be taken either in pills or a bolus, as the patient inclines. The best method is to begin with a single grain four or five times a-day, and gradually to increase the dose as far as the patient can bear it. Musk has sometimes been found to succeed in the epilepsy. Ten or twelve grains of it, with the same quantity of factitious cinnabar, may be made up into a bolus, and taken every night and morning. Sometimes the epilepsy has been cured by electricity. Convulsion fits proceed from the same causes, and must be treated in the same manner as the epilepsy.

OF THE HICCUP.

THE hiccup is a spasmodic or convulsive affection of the stomach and midriff, arising from any cause that irritates their nervous fibres.

CURE.—When the hiccup proves very obstinate, recourse must be had to the most powerful aromatic and antispasmodic medicines. The principal of these is musk; fifteen or twenty grains of which may be made into a bolus, and repeated occasionally. Opi-

ates are likewise of service; but they must be used with caution. A bit of sugar dipped in compound spirits of lavender, or the volatile aromatic tincture, may be taken frequently. External applications are sometimes also beneficial; as the stomach plaster, or a cataplasm of the Venice treacle, applied to the region of the stomach.

CRAMP OF THE STOMACH.

THIS disease often seizes people suddenly, is very dangerous, and requires immediate assistance. It is most incident to persons in the decline of life, especially the nervous, gouty, hysteric, and hypochondriac.

CURE.—Let the stomach be fomented with cloths dipped in warm water; or bladders filled with warm milk and water constantly applied to it. These often produce the most happy effects. In very violent and lasting pains of the stomach, some blood ought to be let, unless the weakness of the patient forbids it. When the pain or cramp proceeds from a suppression of the menses, bleeding is of use. If it be owing to the gout, recourse must be had to spirits, or some of the warm cordial waters. Blisters ought likewise, in this case, to be applied to the ancles. Violent cramps and pains of the stomach are often removed by covering it with a large plaster of Venice treacle.

OF THE NIGHT-MARE.

IN this disease, the patient, in time of sleep, imagines he feels an uncommon oppression or weight about the breast or stomach, which he can by no means shake off. He groans, and sometimes cries out, though oftener he attempts to speak, but in vain. Sometimes he imagines himself engaged with an enemy, and in danger of being killed, attempts to run away, but finds he cannot. Sometimes he fancies himself in a house that is on fire, or that he is in danger of being drowned in a river. He often thinks he is falling over a precipice, and the dread of being dashed

to pieces suddenly awakes him. This disorder has been supposed to proceed from too much blood; from a stagnation of blood in the brain, lungs, &c. But it is rather a nervous affection, and arises chiefly from indigestion. Hence we find that persons of weak nerves, who lead a sedentary life, and live full, are most commonly afflicted with the night-mare. Nothing tends more to produce it than heavy suppers, especially when eaten late, or the patient goes to bed soon after.

CURE.—As persons afflicted with the night-mare generally moan or make some noise in the fit, they should be waked or spoken to by such as hear them, as the uneasiness generally goes off as soon as the patient is awake, or any one limb is moved; but there is oftentimes an universal lassitude of the whole body left behind, which remains for some space of time. Some say a dram of brandy taken at bed-time will prevent this disease. That, however, is a bad custom, and, in time, loses its effect. We would rather have the patient depend upon the use of food of easy digestion, cheerfulness, exercise through the day, and a light supper taken early, than to accustom himself to drams. A glass of peppermint water will often promote digestion as much as a glass of brandy, and is much safer. After a person of weak digestion, however, has eaten flatulent food, a dram may be necessary, in this case we would recommend it as the most proper medicine.

OF FLATULENCIES OR WIND.

ALL nervous patients, without exception, are afflicted with wind or flatulencies in the stomach and bowels, which arise chiefly from the want of tone or vigour in these organs. Crude flatulent aliment, as green peas, beans, coleworts, cabbages, and such like, may increase this complaint; but strong and healthy people are seldom troubled with wind, unless they either overload their stomachs, or drink liquors that are in a fer-

menting state, and consequently full of elastic air. While therefore the matter of flatulence proceeds from our aliment, the cause which makes air separate from them in such quantity as to occasion complaints is almost always a fault of the bowels themselves, which are too weak either to prevent the production of elastic air, or to expel it after it is produced.

CURE.—To relieve this complaint, such medicines ought to be used as have a tendency to expel wind, and, by strengthening the alimentary canal, to prevent its being produced there. The list of medicines for expelling wind is very numerous; they often however disappoint the expectations of both the physician and his patient. The most celebrated among the class of carminatives are juniper-berries; the roots of ginger and zedoary; the seeds of anise, carraway, and coriander; gum-assafætida and opium; the warm waters, tinctures, and spirits, aromatic water, tincture of woodfoot, volatile aromatic spirit, æther, &c. For strengthening the stomach and bowels, and consequently for lessening the production of flatulence, the Peruvian bark, bitters, chalybeates, and exercise, are the best remedies.

OF HYSTERIC COMPLAINTS.

THESE belong to the numerous tribe of nervous diseases, which may be justly reckoned the reproach of medicine. Women of a delicate habit, whose stomach and intestines are relaxed, and whose nervous system is extremely sensible, are most subject to hysteric complaints. In such persons an hysteric fit, as it is called, may be brought on by an irritation of the nerves of the stomach or intestines, by wind, acrid humours, or the like. A sudden suppression of the menses often gives rise to hysteric fits. They may likewise be excited by violent passions.

CURE.—The radical cure of this disorder will be best attempted at a time when the patient is most free from the fits. It will be greatly promoted by a

proper attention to regimen. A milk and vegetable diet, duly persisted in, will often perform a cure. If, however, the patient has been accustomed to a more generous diet, it will not be safe to leave it off all at once, but by degrees. The most proper drink is water with a small quantity of spirits. A cool dry air is the best. Cold bathing, and every thing that braces the nerves, and invigorates the system, is beneficial: but lying too long in bed, or whatever relaxes the body, is hurtful. It is of the greatest importance to have the mind kept constantly easy and cheerful, and, if possible, to have it always engaged in some agreeable and interesting pursuit. The proper medicines are those which strengthen the alimentary canal and the whole nervous system, as the preparations of iron, the Peruvian bark, and other bitters. Twenty drops of the elixir of vitriol, in a cup of the infusions of the bark, may be taken twice or thrice a-day. The chalybeate waters generally prove beneficial in this disorder. Hysteric women are often afflicted with cramps in various parts of the body, which are most apt to seize them in bed, or when asleep. The most efficacious medicines in this case are opium, blistering-plasters, and warm bathing or fomentations. When the cramp or spasm is very violent, opium is the remedy most to be depended on. Cramps are often prevented or cured by compression. Thus cramps in the legs are prevented, and sometimes removed, by tight bandages; and, when convulsions arise from a flatulent distension of the intestines, or from spasms beginning in them, they may be often lessened or cured by making a pretty strong compression upon the abdomen by means of a broad belt. A roll of brimstone held in the hand is frequently used as a remedy for cramps: though this seems to owe its effects chiefly to imagination, yet, as it sometimes succeeds, it merits a trial. When spasms or convulsive motions arise from sharp humours in the stomach and intestines, no lasting relief can be procured till these are either corrected or

expelled. The Peruvian bark has sometimes cured periodic convulsions after other medicines have failed.

OF HYPOCHONDRIAC COMPLAINTS.

THESE generally attack the indolent, the luxurious, the unfortunate, and the studious; and are daily increased by luxury and sedentary employments. Men of a melancholy temperament, whose minds are capable of great attention, and whose passions are not easily moved, are in the advanced periods of life, most liable to this disease. It is usually brought on by long and serious attention to abstruse subjects, grief, the suppression of customary evacuations, excess of venery, the repulsion of cutaneous eruptions, long-continued evacuations, obstructions in some of the viscera, as the liver, spleen, &c.

CURE.—Cheerfulness and serenity of mind are by all means to be cultivated. Exercise of every kind is useful. The cold bath is likewise beneficial; and, where it does not agree with the patient, friction with the flesh-brush or a coarse cloth may be tried. If the patient has it in his power, he ought to travel either by sea or land. A voyage, or a long journey, especially towards a warmer climate, will be of more service than any medicine. The general intentions of cure, in this disease, are to strengthen the alimentary canal, and to promote the secretions. These intentions will be best answered by the different preparations of iron and the Peruvian bark, which, after proper evacuations, may be taken in the same manner as directed in the preceding disease.

OF A SCIRRHUS AND CANCER.

A SCIRRHUS is a hard indolent tumour seated in some of the glands, as the breast, the arm-pits, &c. If the tumour become large, unequal, of a livid, blackish, or leaden colour, and is attended with violent pain, it gets the name of an *occult cancer*. When the skin is broken, and a *sanies* or ichorous matter of an abomi-

nable fœtid smell is discharged from the sore, it is called an *open* or *ulcerated cancer*. Persons after the age of forty-five, particularly women, and those who lead an indolent sedentary life, are most subject to this disease. A cancer is often owing to suppressed evacuations; hence it proves so frequently fatal to women of a gross habit, particularly old maids and widows, about the time when the menstrual flux ceases. It may also be occasioned by the long-continued use of food that is too hard of digestion, or of an acrid nature; by barrenness, celibacy, indolence, cold, blows, friction, pressure, or the like. Women often suffer from the last of these by means of their stays, which squeeze and compress their breasts so as to occasion great mischief. This disorder seems often very trifling at the beginning. A hard tumour about the size of a hazle-nut, or perhaps smaller, is generally the first symptom. This will often continue for a long time without seeming to increase, or giving the patient great uneasiness: but, if the constitution be hurt, or the tumour irritated by pressure, or improper treatment of any kind, it begins to extend itself towards the neighbouring parts, by pushing out a kind of roots or limbs. It then gets the name of *cancer*, from a fancied resemblance between these limbs and the claws of a crab. The colour of the skin begins to change, which is first red, afterwards purple, then bluish, livid, and at last black. The patient complains of heat, with a burning, gnawing, shooting pain. The tumour is very hard, rough, and unequal, with a protuberance, or rising, in the middle; its size increases daily, and the neighbouring veins become thick, knotty, and of a blackish colour. The skin at length gives way, and a thin sharp ichor begins to flow, which corrodes the neighbouring parts till it forms a large unsightly ulcer. More occult cancers arise, and communicate with the neighbouring glands. The pain and stench become intolerable; the appetite fails; the strength is exhausted by a continual hectic fever; at

last, a violent hæmorrhage, or discharge of blood, from some part of the body, with faintings, or convulsion-fits, generally put an end to the miserable patiant's life.

CURE.—This is one of those diseases for which no certain remedy is yet known. Its progress however may sometimes be retarded, and some of its most disagreeable symptoms mitigated, by proper application. One misfortune attending the disease is that the unhappy patient often conceals it too long. Were proper means used in due time, a cancer might often be cured; but after a disorder has arrived at a certain height, it generally sets all medicine at defiance. When a scirrhous tumour is first discovered, the patient ought to observe a proper regimen, and to take twice or thrice a-week a dose of common purging mercurial pills. Some blood may also be let, the part affected may be gently rubbed twice a-day with a little of the mercurial ointment, and kept warm with fur or flannel. The food must be light, and an English pint of the decoction of sarsaparilla may be drunk daily. Should the tumour not yield to this treatment, but, on the contrary, become larger and harder, it will be proper to extirpate it either by the knife or caustic. Indeed, whenever this can be done with safety, the sooner it is done the better. It can answer no purpose to extirpate a cancer after the constitution is ruined, or the whole mass of humours corrupted, by it. This however is the common way, which makes the operation so seldom succeed. Few people will submit to the extirpation till death stares them in the face; whereas, if it were done early, the patient's life would not be endangered by the operation, and it would generally prove a radical cure. The medicine most in repute for this disease is hemlock. Dr. Stork, physician at Vienna, has of late recommended the extract of this plant as very efficacious in cancers of every kind. The doctor says, he has given some hundred-weights of it without ever

hurting any body, and often with manifest advantage. He advises the patient however to begin with very small doses, as two or three grains, and to increase the dose gradually till some good effect be perceived, and there to rest without further increase. From two or three grains at first, the doctor says he has increased the dose to two, three, and four, drachms a-day, and finds that such doses may be continued for several weeks without any bad consequences. The doctor does not pretend to fix the time in which a cancer may be resolved by the use of hemlock, but says he has given it for above two years in large doses without any apparent benefit; nevertheless the patient has been cured by persisting in the use of it for half a year longer. This is at least encouragement to give it a fair trial. The powder of hemlock is by some preferred to the extract. They are both made of the fresh leaves, and may be used nearly in the same manner. Dr. Nicholson, of Berwick, says, he gradually increased the dose of the powder from a few grains to half a drachm, and gave near four drachms of it in the day with remarkably good effect. The hemlock may also be used externally either as a poultice or fomentation. The sore may likewise be kept clean by injecting daily a strong decoction of the tops and leaves into it. Few things contribute more to the healing of foul sordid ulcers of any kind than keeping them thoroughly clean. This ought never to be neglected. The best application for this purpose seems to be the carrot-poultice. The root of the common carrot may be grated, and moistened with as much water as will bring it to the consistence of a poultice or cataplasm. This must be applied to the sore, and renewed twice a-day. It generally cleans the sore, eases the pain, and takes away the disagreeable smell, which are objects of no small importance in such a dreadful disorder. Wort, or an infusion of malt, has been recommended, not only as a proper drink, but as a powerful medicine

in this disease. It must be frequently made fresh, and the patient may take it at pleasure. Two, three, or even four English pints of it may be drunk every day for a considerable time. No benefit can be expected from any medicine, in this disease, unless it be persisted in for a long time. It is of too obstinate a nature to be soon removed; and, when it admits of a cure at all, it must be brought about by inducing an almost total change of the habit, which must always be a work of time. Setons or issues in the neighbourhood of the cancer have sometimes good effects. When all other medicines fail, recourse must be had to opium, as a kind of solace. This will not indeed cure this disease, but it will ease the patient's agony, and render life more tolerable while it continues. To avoid this dreadful disorder, people ought to use wholesome food, to take sufficient exercise in the open air, and carefully to guard against all blows, bruises, and every kind of pressure upon the breasts or other glandular parts.

OF POISONS.

EVERY person ought, in some measure, to be acquainted with the nature and cure of poisons. They are generally taken unawares, and their effects are often so sudden and violent, as not to admit of delay, or allow time to procure the assistance of physicians. Happily indeed no great degree of medical knowledge is here necessary; the remedies for most poisons being generally at hand, or easily obtained, and nothing but common prudence needful in the application of them. The cure of all poisons taken in the stomach, without exception, depends chiefly on discharging them as soon as possible. For this purpose the patient should drink large quantities of new milk and salad-oil till he vomits; or he may drink warm water mixed with oil. Fat broths are likewise proper, provided they can be got ready in time. Where no oil is to be had, fresh butter may be melt-

ed, and mixed with the milk or water. These things are to be drunk as long as the inclination to vomit continues. Some have drunk eight or ten quarts before the vomiting ceased; and it is never safe to leave off drinking while one particle of the poison remains in the stomach. These oily or fat substances not only provoke vomiting, but likewise blunt the acrimony of mineral poison, and prevent its wounding the bowels, but if they should not make the person vomit, half a drachm or two scruples of the powder of ipecacuanha must be given, or a few spoonfuls of the oxymel or vinegar of squills may be mixed with the water which he drinks. Vomiting may likewise be excited by tickling the inside of the throat with a feather. Should those methods however fail, half a drachm of white vitriol, or five or six grains of emetic tartar, must be administered. If tormenting pains are felt in the lower belly, and there is reason to fear that the poison has got down to the intestines, clysters of milk and oil must be very frequently thrown up; and the patient must drink emollient decoctions of barley, oatmeal, marsh-mallows, and such like. He must likewise take an infusion of senna and manna, a solution of Glauber's salts, or some other purgative. After the poison has been evacuated, the patient ought, for some time, to live upon such things as are of a healing and cooling quality; to abstain from flesh, and all strong liquors, and to live upon milk, broth, gruel, light puddings, and other spoon-meats of easy digestion. His drink should be barley-water, linseed tea, or infusions of any of the mild mucilaginous vegetables. Though vegetable poisons, when allowed to remain in the stomach, often prove fatal; yet the danger is generally over as soon as they are discharged. Not being of such a caustic or corrosive nature, they are less apt to wound or inflame the bowels than mineral substances; no time however, ought to be lost in having them discharged. For the bites of poisonous animals, a great variety of certain

and immediate cures are pointed out in the Herbal. For the bite of a viper, however, the wound should be sucked, and afterwards rubbed with warm salad-oil. A poultice of bread and milk, softened with salad-oil, should likewise be applied to the wound: and the patient ought to drink freely of vinegar-whey, or water gruel with vinegar in it, to make him sweat. Vinegar is one of the best drinks which can be used in any kind of poison, and ought to be taken very liberally. If the patient be sick, he may take a vomit. This course will be sufficient to cure the bite of any of the poisonous animals of this country. It is the happiness of this island to have very few poisonous animals, and those which we have are by no means of the most violent kind. We cannot however make the same observation with regard to poisonous vegetables: these abound every where, and prove often fatal to the ignorant and unwary. This indeed is chiefly owing to carelessness. Children ought early to be cautioned against eating any kind of fruit, roots, or berries, which they do not know; and all poisonous plants to which they can have access, ought, as far as possible, to be destroyed. This would not be so difficult a task as some people imagine, were this Herbal kept in all families, and their children made to read lessons from it, as an easy occasional task. This, I think, will appear an indespensable duty in parents, when we reflect, that seldom a year passes but we have accounts of several persons poisoned by eating hemlock roots instead of parsnips, or some kind of fungus which they had gathered for mushrooms. These examples ought to put people upon their guard with respect to the former, and put the latter entirely out of use. We might here mention many other plants and animals of a poisonous nature which are found in foreign countries; but, as our observations are chiefly intended for this island, we shall pass this over. It may not, however, be amiss to observe, for the be-

hoof of such of our countrymen as go to America, that an effectual remedy is now said to be found for the bite of a rattlesnake.—The prescription is as follows; Take of the roots of plantain and horehound, in summer, roots and branches together, a sufficient quantity; bruise them in a mortar, and squeeze out the juice; of which give, as soon as possible, one large spoonful; if the patient be swelled you must force it down his throat. This generally will cure; but, if he finds no relief in an hour after, you may give another spoonful, which seldom fails.—If the roots are dried, they must be moistened with a little water. To the wound may be applied a leaf of good tobacco moistened with rum. We give this upon the faith of Dr. Brookes, who says it was the invention of a negro; for the discovery of which he had his freedom purchased, and an hundred pounds per annum settled upon him during life, by the General Assembly of Carolina.

OF INFLAMMATION AND ABSCESSES.

From whatever cause an inflammation proceeds, it must terminate either by dispersion, suppuration, or gangrene. Though it is impossible to foretel with certainty in which of these ways any particular inflammation will terminate, yet a probable conjecture may be formed with regard to the event, from a knowledge of the patient's age and constitution. Inflammations happening in a slight degree upon colds, and without any previous indisposition, will most probably be dispersed; those which follow close upon a fever, or happen to persons of gross habit of body, will generally suppurate; and those which attack very old people, or persons of a dropsical habit, will have a strong tendency to gangrene.

Cure.—If the inflammation be slight, and the constitution sound, the dispersion ought always to be attempted. This will be best promoted by a slender diluting diet, plentiful bleeding, and repeated purges.

The part itself must be fomented, and, if the skin be very tense, it may be embrocated with a mixture of three fourths of sweet oil, and one fourth of vinegar, and afterwards covered with a piece of wax plaster. If, notwithstanding these applications, the symptomatic fever increases, and the tumour becomes larger, with violent pain and pulsation, it will be proper to promote the suppuration. The best application for this purpose is a soft poultice, which may be renewed twice a-day. If the suppuration proceeds but slowly, a raw onion cut small or bruised may be spread upon the poultice. When the abscess is ripe or fit for opening, which may easily be known from the thinness of the skin in the most prominent part of it, a fluctuation of matter which may be felt under the finger, and, generally speaking, an abatement of the pain, it may be opened either with a lancet or by means of a caustic. The last way in which an inflammation terminates is in a gangrene or mortification, the approach of which may be known by the following symptoms: The inflammation loses its redness, and becomes duskish or livid; the tension of the skin goes off, and it feels flabby; little bladders filled with ichor of different colours spread all over it; the tumour subsides, and from a duskish complexion becomes black; a quick low pulse, with cold clammy sweats, are the immediate forerunners of death. When these symptoms first appear, the part ought to be dressed with London treacle, or a cataplasm made of lixivium and bran; should the symptoms become worse, that part must be scarified, and afterwards dressed with basilicon softened with oil of turpentine. All the dressings must be applied warm. With regard to internal medicines, the patient must be supported with generous cordials, and the Peruvian bark exhibited in as large doses as the stomach will bear it. If the mortified partsshould separate, the wound will become a common ulcer, and must be treated accordingly. This article includes the treatment of all those dis-

eases, which, in different parts of the country, go by the name of biles, imposthumes, whitloes, &c. They are all abscesses in consquence of a previous inflammation, which, if possible, ought to be discussed, but, when this cannot be done, the suppuration should be promoted, and the matter discharged by an incision, if nccessary; afterwards the sore may be dressed with yellow basilicon, or some other digestive ointment.

OF WOUNDS.

No part of medicine has been more mistaken than the treatment or cure of wounds. It is however a fact, that no external application whatever, contributes towards the cure of a wound, any other way than by keeping the parts soft, clean, and defending them from the external air, which may be as effectually done by dry lint as by the most pompous applications, while it is exempt from many of the bad consequences attending them. The same observation holds with respect to internal applications. These only promote the cure of wounds as far as they tend to prevent a fever, or to remove any cause that might obstruct or impede the operations of nature. It is nature alone that cures the wounds; all that art can do is to remove obstacles, and to put the parts in such a condition as is the most favourable to nature's efforts.

CURE.—The first thing to be done, when a person has received a wound, is to examine whether any foreign body be lodged in it, as wood, stone, iron, lead, glass, dirt, bits of cloth, or the like. These if possible, ought to be extracted, and the wound cleaned, before any dressings be applied. When that cannot be effected with safety, on account of the patient's weakness, or loss of blood, they must be suffered to remain in the wound, and afterwards extracted when he is more able to bear it. When a wound penetrates into any of the cavities of the body, as the breast, the bowels, &c. or where any considerable blood-vessel is cut, a skilful surgeon ought immediately to be called, other-

wise the patient may lose his life. But sometimes the discharge of blood is so great, that, if it be not stopped, the patient may die, even before a surgeon, though at no great distance, can arrive. In this case, something must be done by those who are present. If the wound be in any of the limbs, the bleeding may generally be stopped by applying a tight ligature or bandage round the member a little above the wound. In parts where this bandage cannot be applied, various other methods may be tried to stop the bleeding, as the application of styptics, astringents, &c. Cloths dipped in a solution of blue vitriol in water, or the styptic water of the dispensatories, may be applied to the wound. When these cannot be obtained, strong spirits of wine may be used. Some recommend the agaric of oak as preferable to any of the other styptics; and indeed it deserves considerable encomiums. It is easily obtained, and ought to be kept in every family, in case of accidents. A piece of it must be laid upon the wound, and covered with a good deal of lint, above which a bandage may be applied so tight as to keep it firmly on. Though spirits, tinctures, and hot balsams, may be used, in order to stop the bleeding when it is excessive, they are improper at other times. They do not promote but retard the cure, and often change a simple wound into an ulcer. People imagine, because hot balsams congeal the blood, and seem as it were to solder up the wound, that they therefore heal it; but this is only a deception. They may indeed stop the flowing blood, by searing the mouths of the vessels; but, by rendering the parts callous, they obstruct the cure. When a wound is greatly inflamed, the most proper application is a poultice of bread and milk, softened with a little sweet oil or fresh butter. This must be applied instead of a plaster, and should be changed twice a-day. If the wound be large, and there is reason to fear an inflammation, the patient should be kept on a very low diet. He must abstain from flesh, strong liquors, and every thing that is of

a heating nature. If he be of a full habit, and has lost but little blood from the wound. He must be bled; and, if the symptoms be urgent, the operation may be repeated. But, when the patient has been greatly weakened by loss of blood from the wound, it will be dangerous to bleed him, even though a fever should ensue. Nature should never be too far exhausted: it is always more safe to allow her to struggle with the disease in her own way, than to sink the patient's strength by excessive evacuations.

OF BURNS.

In slight burns which do not break the skin, it is customary to hold the part near the fire for a competent time, to rub it with salt, or to lay a compress upon it dipped in spirits of wine or brandy. But, when the burn has penetrated so deep as to blister or break the skin, it must be dressed with some of the liniments for burns, or with the emollient and gently-drying ointment, commonly called Turner's cerate. This may be mixed with an equal quantity of fresh olive oil, and spread upon a soft rag, and applied to the part affected. When this ointment cannot be had, an egg may be beat up with about an equal quantity of the sweetest salad oil. This will serve very well till a proper ointment can be prepared. When the burning is very deep, after the first two or three days, it should be dressed with equal parts of yellow basilicon and Turner's cerate mixed together. When the burn is violent, or has occasioned a high degree of inflammation, and there is reason to fear a gangrene or mortification, the same means must be used to prevent it as are recommended in other violent inflammations. The patient in this case must live low, and drink freely of weak diluting liquors. He must likewise be bled, and have his body kept open. But, if the burnt part should become livid or black, with other symptoms of mortification, it will be necessary to bathe them frequently with warm camphorated spirits of wine, tincture

of myrrh, or other antiseptics, mixed with a decoction of the bark. In this case the bark must likewise be taken internally, and the patient's diet must be more generous.

OF BRUISES.

In slight bruises it will be sufficient to bathe the part with warm vinegar, to which a little brandy or rum may occasionally be added, and to keep cloths wet with this mixture constantly applied to it. This is more proper than rubbing it with brandy, spirits of wine, or other ardent spirits, which are commonly used in such cases. In some parts of the country, the peasants apply to a recent bruise a cataplasm of fresh cow-dung. I have often seen this cataplasm applied to violent contusions occasioned by blows, falls, bruises, and such like; and never knew it fail to have a good effect. When a bruise is very violent, the patient ought immediately to be bled, and put upon a proper regimen. His food should be light and cool, and his drink weak and of an opening nature; as whey sweetened with honey, decoctions of tamarinds, barley, cream-tartar whey, and such like. The bruised part must be bathed with vinegar and water as directed above; and a poultice, made by boiling of crumbs of bread, elder-flower, and camomile-flowers, in equal quantities of vinegar and water, applied to it. This poultice is peculiarly proper when a wound is joined to the bruise. It may be renewed two or three times a-day. As the structure of the vessels is totally destroyed by a violent bruise, there often ensues a great loss of substance, which produces an ulcerous sore, very difficult to cure. If the bone be affected, the sore will not heal before an exfoliation takes place; that is, before the diseased part of the bone separates, and comes out through the wound. This is often a very slow operation, and may even require several years to be completed. Hence it happens, that these sores are frequently mistaken for the king's evil, and

treated as such, though, in fact, they proceed solely from the injury which the solid parts received from the blow. Patients in this situation are pestered with different advice. Every one who sees them proposes a new remedy, till the sore is so much irritated with various and opposite applications, that it is often at length rendered absolutely incurable. The best method of managing such sores is, to take care that the patient's constitution does not suffer by confinement or improper medicine, and to apply nothing to them but some simple ointment spread upon soft lint, over which a poultice of bread and milk, with boiled camomile flowers, or the like, may be put, to nourish the part, and keep it soft and warm. Nature, thus assisted, will generally in time operate a cure, by throwing off the diseased parts of the bone; after which the sore soon heals.

OF ULCERS.

Ulcers may be the consequence of wounds, bruises, or imposthumes, improperly treated; they may likewise proceed from an ill state of the humours, or what may be called a bad habit of body. In the latter case, they ought not to be hastily dried up, otherwise it may prove fatal to the patient. Ulcers happen most commonly in the decline of life; and persons who neglect exercise, and live grossly, are most liable to them. They might often be prevented by retrenching some part of the solid food, or by opening artificial drains, as issues, setons, or the like. It requires considerable skill to be able to judge whether or not an ulcer ought to be dried up. In general, all ulcers which proceed from a bad habit of body should be suffered to continue open, at least, till the constitution has been so far changed by proper regimen, or the use of medicine, that they seem disposed to heal of their own accord. Ulcers which are the effect of malignant fevers, or other acute diseases, may generally be healed with safety

after the health has been restored for some time. The cure ought not, however, to be attempted too soon, nor at any time without the use of purging medicines and a proper regimen. When wounds or bruises have, by wrong treatment, degenerated into ulcers, if the constitution be good, they may generally be healed with safety. When ulcers either accompany chronical diseases, or come in their stead, they must be cautiously healed. If an ulcer conduces to the patient's health, from whatever cause it proceeds, it ought not to be healed; but if, on the contrary, it wastes the strength, and consumes the patient by slow fever, it should be healed as soon as possible. We would earnestly recommend a strict attention to these particulars, to all who have the misfortune to labour under this disorder, particularly persons in the decline of life; as we have frequently known people throw away their lives by the want of it, while they were extolling and generously rewarding those whom they ought to have looked upon as their executioners. The most proper regimen for promoting the cure of ulcers is to avoid all spices, salted and high-seasoned food, all strong liquors, and to lessen the usual quantity of flesh meat. The body ought to be kept gently open by a diet consisting chiefly of cooling laxative vegetables, and by drinking butter-milk, whey sweetened with honey, or the like. A fistulous ulcer can seldom be cured without an operation. It must either be laid open so as to have its callous parts destroyed by some corrosive application, or they must be entirely cut away with the knife; but as this operation requires the hand of an expert surgeon, there is no occasion to describe it. Ulcers about the anus are most apt to become fistulous, and are very difficult to cure. Some, indeed, pretend to have found Ward's fistula paste very successful in this complaint. It is not a dangerous medicine, and being easily procured, it may deserve a trial; but as these ulcers generally proceed from an

ill habit of the body, they will seldom yield to any thing except a long course of regimen, assisted by medicines, which are calculated to correct that particular habit, and to induce an almost total change in the constitution.

OF DISLOCATIONS.

WHEN a bone is moved out of its place or articulation, so as to impede its proper functions, it is said to be luxated or dislocated. As this often happens to persons in situations where no medical assistance can be obtained, by which means limbs and even lives are frequently lost, we shall endeavour to point out the method of reducing the most common luxations, and those which require immediate assistance. Any person of common sense and resolution, who is present when a dislocation happens, may often be of more service to the patient than the most expert surgeon can after the swelling and inflammation have come on. When these are present, it is difficult to know the state of the joint, and dangerous to attempt a reduction; and, by waiting till they are gone off, the muscles become so relaxed, and the cavity filled up, that the bone can never after be retained in its place. A recent dislocation may generally be reduced by extension alone, which must always be greater or less according to the strength of the muscles which move the joint, the age, robustness, and other circumstances of the patient. When the bone has been out of its place for any considerable time, and a swelling or inflammation has come on, it will be necessary to bleed the patient, and after fomenting the part, to apply soft poultices with vinegar to it for some time before the reduction is attempted. All that is necessary after the reduction; is to apply cloths dipped in vinegar or camphorated spirits of wine to the part, and to keep it perfectly easy. Many bad consequences proceed from the neglect of this rule. A dislocation seldom happens without

the tendons and ligaments of the joint being stretched, and sometimes torn. When these are kept easy till they recover their strength and tone, all goes on very well; but, if the injury be increased by too frequent an exertion of the parts, no wonder if they be found weak and diseased ever after.

DISLOCATION OF THE JAW.—The usual method of reducing a dislocated jaw, is to set the patient on a low stool, so as an assistant may hold the head firm by pressing it against his breast. The operator is then to thrust his two thumbs, being first wrapped up with linen cloths that they may not slip, as far back into the patient's mouth as he can, while his fingers are applied to the jaw externally. After he has got firm hold of the jaw, he is to press it strongly downwards and backwards, by which means the elapsed heads of the jaws may be easily pushed into their former cavities. The peasants, in some parts of the country, have a peculiar way of performing this operation. One of them puts a handkerchief under the patient's chin, then, turning his back to that of the patient, pulls him up by the chin so as to suspend him from the ground. This method often succeeds; but we think it a dangerous one, and therefore recommend the former.

DISLOCATION OF THE NECK.—The neck may be dislocated by falls, violent blows, or the like. In this case, if the patient receives no assistance, he soon dies, which makes people imagine the neck was broken; it is, however, for the most part, only partially dislocated, and may be reduced by almost any person who has resolution enough to attempt it. A complete dislocation of the neck is instant death. When the neck is dislocated, the patient is immediately deprived of all sense and motion; his neck swells, his countenance appears bloated, his chin lies upon his breast, and his face is generally turned towards one side. To reduce this dislocation, the unhappy person should immediately be laid upon his

back on the ground, and the operator must place himself behind him so as to be able to lay hold of his head with both his hands, while he makes a resistance by placing his knees against the patient's shoulders. In this posture he must pull the head with considerable force, gently twisting it at the same time if the face be turned on one side, till he perceives that the joint is replaced, which may be known from the noise which the bones generally make when going in, the patient's beginning to breathe, and the head continuing in its natural posture. After the neck is reduced, the patient ought to be bled, and should be suffered to rest for some days, till the parts recover their proper tone.

DISLOCATION OF THE SHOULDER.—The humerus or upper bone of the arm may be dislocated in various directions: it happens however most frequently downwards, but very seldom directly upwards. From the nature of its articulation, as well as from its exposure to external injuries, this bone is the most subject to dislocation of any in the body. A dislocation of the humerus may be known by a depression or cavity on the top of the shoulder, and an inability to move the arm. When the dislocatiou is downward or forward, the arm is elongated, and a ball or lump is perceived under the arm-pit; but, when it is backward, there appears a protuberance behind the shoulder, and the arm is thrown forwards towards the breast. The usual method of reducing dislocations of the shoulder is to seat the patient on a low stool, and to cause an assistant to hold his body so that it may not give way to the extension, while another lays hold of the arm a little above the elbow, and gradually extends it. The operator then puts a napkin under the patient's arm, and causes it to be tied behind his own neck; by this, while a sufficient extension is made, he lifts up the head of the bone, and with his hands directs it into the proper place. There are various machines invented for facilitating this operation, but the hand of an ex-

pert surgeon is always more safe. In young and delicate patients, it is a very easy matter to reduce the shoulder by extending the arm with one hand, thrusting in the head of the bone with the other. In making the extension, the arm ought always to be a little bent.

DISLOCATION OF THE ELBOW.—The bones of the forearm may be dislocated in any direction. When this is the case, a protuberance may be observed on that side of the arm towards which the bone is pushed, from which, and the patient's inability to bend his arm, a dislocation of this joint may easily be known. Two assistants are generally necessary for reducing a dislocation of the elbow; one of them must lay hold of the arm above, and the other below, the joint, and make a pretty strong extension, while the operator returns the bones into their proper place. Afterwards the arm must be bent and suspended for some time with a sling about the neck. Luxations of the wrist and fingers are to be reduced in the same manner as those of the elbow, viz. by making an extension in different directions, and thrusting the head of the bone into its place.

DISLOCATION OF THE THIGH.—When the thigh-bone is dislocated forward and downward, the knee and foot are turned out, and the leg is longer than the other; but, when it is displaced backward, it is usually pushed upward at the same time, by which means the limb is shortened, and the foot is turned inwards. When the thigh-bone is displaced forward and downward, the patient, in order to have it reduced, must be laid upon his back, and made fast by bandages, or held by assistants, while by others an extension is made by means of slings fixed about the bottom of the thigh a little above the knee. While the extension is made, the operator must push the head of the bone outward, till it gets into the socket. If the dislocation be outwards, the patient must be laid upon his face, and, during the extension, the head of the bone must be pushed inward. Dislocations of the knees, ancles,

and toes, are reduced much in the same manner as those of the upper extremities, viz. by making an extension in opposite directions, while the operator replaces the bones. In many cases, however, the extension alone is sufficient, and the bone will slip into its place merely by pulling the limb with sufficient force. It is not hereby meant, that force alone is sufficient for the reduction of dislocations.

OF BROKEN BONES, &c.

THERE is, in most country villages, some person who pretends to the art of reducing fractures. Though, in general, such persons are very ignorant, yet some of them are very successful; which evidently proves, that a small degree of learning, with a sufficient share of common sense and a mechanical head, will enable a man to be useful in this way. We would, however, advise people never to employ such operators, when an expert and skilful surgeon can be had; but, when that is impractible, they must be employed: we shall therefore recommend the following hints to their consideration: When a large bone is broken, the patient's diet ought, in all respects, to be the same as in an inflammatory fever. He should likewise be kept quiet and cool, and his body open by emollient clysters, or, if these cannot be conveniently administered, by food that is of an opening quality; as stewed prunes, apples boiled in milk, boiled spinage, and the like. It ought however to be here remarked, that persons who have been accustomed to live high are not all of a sudden to be reduced to a very low diet. This might have fatal effects. There is often a necessity for indulging even bad habits, in some measure, where the nature of the disease might require a different treatment. It will generally be necessary to bleed the patient immediately after a fracture, especially if he be young, of a full habit, or has, at the same time, received any bruise or contusion. This operation should not only be performed soon after the accident happens, but, if

the patient be very feverish, it may be repeated next day. When several of the ribs are broken, bleeding is peculiarly necessary. If any of the large bones which support the body are broken, the patient must keep his bed for several weeks. It is by no means necessary, however, that he should lie all that time, as is customary, upon his back. This situation sinks the spirits, galls and frets the patient's skin, and renders him very uneasy. After the second week he may be gently raised up, and may sit several hours, supported by a bed-chair, or the like, which will greatly relieve him. Great care, however, must be taken, in raising him up, and laying him down, that he make no exertions himself, otherwise the action of the muscles may pull the bone out of its place. It has been customary, when a bone was broken, to keep the limb for five or six weeks continually upon the stretch. But this is a bad posture. It is both uneasy to the patient and unfavourable to the cure. The best situation is to keep the limb a little bent. This is the posture into which every animal puts its limb when it goes to rest, and in which fewest muscles are upon the stretch. It is easily effected, by either laying the patient upon his side, or making the bed so as to favour this position of the limb. All that art can do towards the cure of a broken bone, is to lay it perfectly straight, and to keep it quite easy. All tight bandages do hurt. They had much better be wanting altogether. A great many of the bad consequences which succeed to fractured bones are owing to the hospital-practice of tight bandages. The best method of retention is by two or more splints made of leather or pasteboard. These, if moistened before they be applied, soon assume the shape of the included member, and are sufficient, with the assistance of a very slight bandage, for all the purposes of retention. The splints should always be as long as the limb, with holes cut for the ankles when the fracture is in the leg. In fractures of the ribs, where a bandage cannot be

properly used, an adhesive plaster may be applied over the part. The patient, in this case, ought to keep himself quite easy, avoiding every thing that may occasion sneezing, laughing, coughing, or the like. He ought to keep his body in a straight posture, and should take care that his stomach be constantly distended, by taking frequently some light food, and drinking freely of weak watery liquors. The most proper external application for a fracture is *oxycrate*, or a mixture of vinegar and water. The bandages should be wet with this at every dressing.

OF STRAINS.

STRAINS are often attended with worse consequences than broken bones. The reason is obvious; they are generally neglected. When a bone is broken, the patient is obliged to keep the member easy, because he cannot make use of it; but, when a joint is only strained, the person, finding he can still make a shift to move it, is sorry to lose his time for so trifling an ailment. In this way he deceives himself, and converts into an incurable malady what might have been removed by only keeping the part easy for a few days. Country people generally immerse a strained limb in cold water. This is very proper, providing it be done immediately, and not kept in too long. But the custom of keeping the part immersed in cold water for a long time, is certainly dangerous. It relaxes instead of bracing the part, and is more likely to produce a disease than remove one. Wrapping a garter, or some other bandage, pretty tight about the strained part, is likewise of use. It helps to restore the proper tone of the vessels, and prevents the action of the parts from increasing the disease. It should not however be applied too tight. Bleeding near the affected part will frequently have a very good effect: but what we would recommend above all is ease. It is more to be depended on than any medicine, and seldom fails to remove the complaint.

OF RUPTURES

CHILDREN and very old people are most liable to this disease. In the former it is generally occasioned by excessive crying, coughing, vomiting, or the like. In the latter, it is commonly the effect of blows or violent exertions of the strength, as leaping, carrying great weights, &c. In both, a relaxed habit, indolence, and an oily or very moist diet, disposes the body to this disease. A rupture sometimes proves fatal before it is discovered. Whenever sickness, vomiting and obstinate costiveness, give reason to suspect an obstruction of the bowels, all those places where ruptures usually happen ought carefully to be examined. The protrusion of a very small part of the gut will occasion all these symptoms; and, if not returned in due time, will prove mortal. On the first appearance of a rupture in an infant, it ought to be laid upon its back, with its head very low. While in this posture, if the gut does not return of itself, it may easily be put up by gentle pressure. After it is returned, a piece o sticking plaster may be applied over the part, and a proper truss or bandage must be constantly worn for a considerable time. The method of making and applying these rupture-bandages for children is pretty well known. The child must, as far as possible, be kept from crying, and from all violent motion, till the rupture is quite healed. In adults, when the gut has been forced down with great violence, or happens, from any cause, to be inflamed, there is often great difficulty in returning it. The patient should be bled; after which, he must be laid upon his back, with his head very low, and his breech raised high with pillows. In this situation flannel cloths wrung out of a decoction of mallows and camomile-flowers, or, if these are not at hand, of warm water, must be applied for a considerable time. A clyster made of this decoction, with a large spoonful of butter and a little salt may be afterwards thrown up. If these should not prove

successful, recourse must be had to pressure. If the tumour be very hard, considerable force will be necessary; but it is not force alone which succeeds here. The operator, at the same time that he makes a pressure with the palms of his hands, must with his fingers artfully conduct the gut in by the same aperture through which it came out. The manner of doing this can be much easier conceived than described. Should these endeavours prove ineffectual, clysters of the smoke of tobacco may be tried. These have been often known to succeed where every other method failed. An adult, after the gut has been returned, must wear a steel bandage. It is needless to describe this, as it may always be had ready-made from the artists. Such bandages are generally irksome to the wearer for some time, but by custom they become quite easy. No person, who has had a rupture after he arrived at man's estate, should ever be without one of these bandages. Persons who have a rupture ought carefully to avoid all violent exercise, carrying great weights, leaping, running, and the like. They should likewise avoid windy aliment and strong liquors; and should carefully guard against catching cold.

OF RECOVERING DROWNED PERSONS.

THE length of time during which a person may remain immersed in water, without being drowned, is very unequal, in different individuals: and depends as much on the temperature of the water as on the particular constitution of the subject: in general, however, there is less prospect of recovery, after having continued fifteen minutes in a watery grave. In such cases, death ensues from impeded respiration, and the consequent ceasing of the circulation of the blood, by which the body loses its heat, and, with that, the activity of the vital principle. The water produces all the changes which take place in drowning, only indirectly, by excluding the atmospheric air from the lungs, as they admit but a very consider-

able quantity of fluid to pass into them during immersion. Hence we shall find, in the progress of this inquiry, that inflation of the lungs is one of the principal means of restoring life.

Before we describe the various methods and instruments that have been successfully adopted, for recovering drowned persons, it will be useful to advert to those circumstances which deserve to be duly weighed, previous to any active measures being taken on such unfortunate occasions: 1. The season and weather; 2. Length of time the person has continued under water; 3. The state of his mind when the accident happened: whether he was intoxicated, frightened, &c.; 4. Constitution of the body, and whether he was in a state of perspiration; 5. The height from which he fell, and whether his head plunged foremost; 6. Depth of the water; whether it was cold or warm, sea, or river water, and how he was dressed. Lastly, 7. The manner in which he was taken out, whether by the legs, and without receiving any injury, or by instruments; and whether he was rolled about in a tub, or what other methods were pursued for his restoration.

Symptoms of Apparent Death by Drowning.—Coldness; paleness of the whole body; the lips of a livid hue; the mouth either open or firmly closed; the tongue blue, swelled and protruded; the eye-lids closed, the eyes turned, and their pupils dilated; the face swelled and blue; the lower belly hard and inflated. The first signs of returning animation are, convulsive starting of the muscles of the face, or feet, motion of the eye-lids; a spasmodic shivering of the body.

Treatment.—1. After having been carefully taken out of the water by the arms, so as to prevent the least injury to the head and breast, the body ought to be carried to the nearest house (if possible on a bier) with the head somewhat raised; or, in fine warm weather, the resuscative process may with more ad-

vantage be performed in the open air, especially in sun-shine.

2. When the subject is deposited, the upper part of the body should be supported half-sitting, with the head inclining towards the right side.

3. The clothes are to be taken off without delay, but with the greatest precaution; as violent shaking of the body might extinguish the latent spark of life.

4. The mouth and nose must be cleansed from the mucus and froth, by means of a feather dipped in oil.

5. The whole body should now be gently wiped and dried with warm flannel cloths, then covered with blankets, feather-beds, hay, straw, &c. In cold or moist weather, the patient is to be laid on a mattres or bed, at a proper distance from the fire, or in a room moderately heated; but in the warm days of summer, a simple couch is sufficient.

6. If the patient be very young, or a child, it may be placed in bed between two persons, to promote natural warmth.

7. In situations where the bath cannot be conveniently procured, bladders filled with lukewarm water should be applied to different parts of the body, particularly to the pit of the stomach; or a warming pan wrapped in flannel gently moved along the spine; or aromatic fomentations frequently and cautiously repeated.

8. As the breathing of many persons in an apartment would render the air mephitic, and thus retard, or even prevent the restoration of life, not more than five or six assistants should be suffered to remain in the room where the body is deposited.

Stimulants generally employed:—1. Moderate friction with soft, warm flannel, at the beginning, and gradually increased by means of brushes dipped in oil, till pulsations of the heart are perceptible.

2. Inflation of the lungs, which may be more con-

veniently effected by blowing into one of the nostrils than by introducing air into the mouth. For the former purpose, it is necessary to be provided with a wooden pipe, fitted at one extremety for filling the nostrils, and at the other for being blown into by a healthy person's mouth, or for receiving the muzzle of a pair of common bellows, by which the operation may be longer continued. At first, however, it will always be proper to introduce the warm breath from the lungs of a living person, than to commence with cold atmospheric air. During this operation, the other nostril and the mouth should be closed by an assistant, while a third person gently presses the chest with his hands, as soon as the lungs are observed to be inflated.

3. Stimulating clysters, consisting of warm water and common salt; or a strong solution of tartar emetic; or decoctions of aromatic herbs; or six ounces of brandy, should be speedily administered. We do not consider injections of the smoke of tobacco, or even clysters of that narcoctic plant, in all instances safe or proper.

4. Let the body be gently rubbed with common salt, or with flannels dipped in spirits; the pit of the stomach fomented with hot brandy; the temples stimulated with spirit of hartshorn; and the nostrils occasionally tickled with a feather.

5. Persons of a very robust frame, and whose skin after being dried assumes a rigid and contracted surface, may be put into the sub-tepid bath, of about 65 deg., which must be gradually raised to 75 or 80 deg. of Fahrenheit's scale, according to circumstances; or the body carried to a brewhouse, and covered with warm grains for three or four hours: but these expedients generally require medical assistance.

6. Violent shaking and agitation of the body by the legs and arms, though strongly recommended, and supposed to have often forwarded the recovery of children and boys, appears to us a doubtful remedy, which can be practised only in certain cases.

7. Sprinkling the naked body of a drowned person with cold water; submitting it to the operation of a shower bath, or the sudden shocks of the electric fluid; as well as whipping it with nettles, administering emetics, and blood-letting,—are desperate expedients, which should be resorted to only after the more lenient means have been unsuccessfully employed.

It is, however, a vulgar and dangerous error, to suppose that persons apparently dead by immersion under water, are irrecoverable, because life does not soon re-appear; hence we seriously entreat those who are thus employed in the service of humanity, to persevere for three or four hours at least, in the application of the most appropriate remedies above described; for there are many instances recorded, of patients who recovered after they had been relinquished by all their medical and other assistants.

Treatment on the return of Life:—As soon as the first symptoms of that happy change becomes discernible, additional care must be taken to cherish the vital action, by the most soothing means. All violent proceedings should therefore, be immediately abandoned, no farther stimulants applied, nor even the ears of the patient be annoyed by loud speaking, shouting, &c. At that important crisis, moderate friction only is requisite. And, if the reviving person happen to be in the bath, he may either remain there, provided his sensation be easy and agreeable, or be removed to a comfortable bed, after being expeditiously dried with warm flannels; fomentations of aromatic plants may then be applied to the pit of the stomach; bladders filled with warm water placed to the left side; the soles of the feet rubbed with salt; the mouth cleared of froth and mucus, and a little white wine, or a solution of salt in water, dropped on the tongue. But all strong stimulants, such as powerful electric shocks, strong odours of volatile salts, &c. are at this period particularly

injurious. Lastly, the patient, after resuscitation, ought to be for a short interval resigned to the efforts of Nature, and left in a composed and quiescent state: as soon as he is able to swallow, without compulsion or persuasion, warm wine, or tea, with a few drops of vinegar, instead of milk, or gruel, warm beer, and the like, should be given in small doses frequently repeated.

Having stated the leading particulars to be attended to, in the practical treatment of persons who are on the eve of suffering from aquatic suffocation, we shall accompany them with a few directions, addressed to those humane assistants who often fall victims for want of due precaution in the execution of their benevolent design.

As many fatal accidents happen to individuals who wish to rescue others in danger of being drowned, especially when the former are unskilful in the useful art of swimming, which ought to be learnt at an early period of life, we think it our duty to remind the reader of the two excellent contrivances, the Air-jacket, and Bamboe habit.

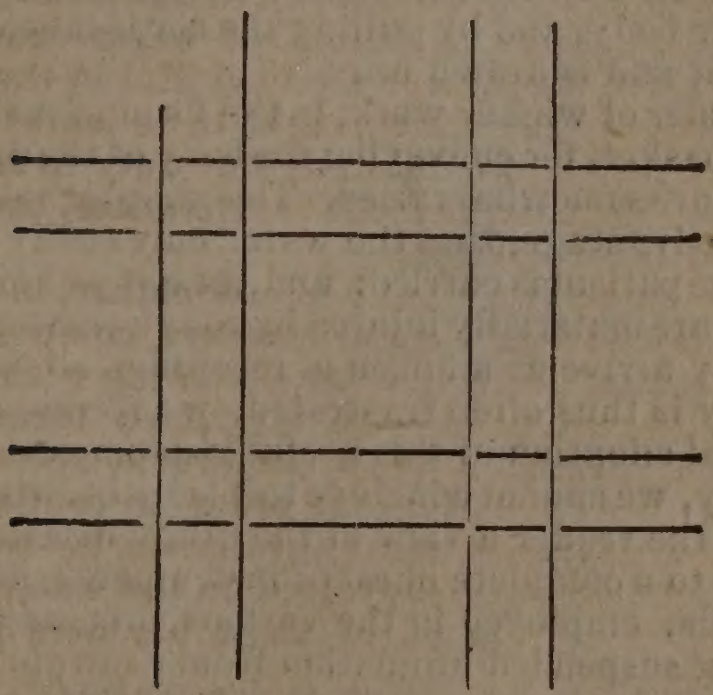
The Air-jacket is a dress made of leather, in which are contained several bags or bladders, composed of the same materials, and communicating with each other. These are filled with air blown through a leather tube, having a brass stop-cock, accurately ground at its extremety. In order to confine this elastic fluid, the jacket must previously be wetted; and thus the person is supported in the water without any effort, by the aid of these bladders placed near the breast.

The Bamboe Habit is an invention of the Chinese, by the use of which a person unskilled in the art of swimming may easily keep himself above water. The Chinese merchants, when going on a voyage, always provide themselves with this simple apparatus, to save their lives, in cases of danger from shipwreck. It is constructed by placing four bamboes horizontally,

two before and two behind the body of each person, so that they project about twenty-eight inches: these are crossed on each side by two others, and the whole properly secured, leaving an intermediate space for the body. When thus formed, the person in danger slips it over his head, and ties it securely to the waist; by which simple means he cannot possibly sink.

In lieu of Bamboes, four pieces of light wood of sufficient strength, with pieces of cork secured along the whole length of each piece, forms a machine calculated to enable any one to venture into water, however deep, with safety.

Its figure is here subjoined.



Every family dwelling on the banks of lakes or rivers, or near ponds, ought to be always provided with two or three such useful articles, to serve in cases of emergency; as it will generally be too late to procure them on the spur of the occasion.

Instruments for recovering the Drowned.

1. A forked instrument with blunt points, for mak-

ing a superficial search after the drowned body, and sounding the particular situation in which it lies.

2. In winter, in cases of immersion by breaking of the ice, a useful instrument is a ladder, to one end of which is attached a long handle, by which it admits of being pushed over the aperture by a person standing on a firm part of the ice, while another places himself on it over the aperture, and is thus enabled to search for the body, by an instrument called an *Extractor*.

3. The *Extractor* is a linked pair of tongs, which on immersing it into water, opens by its own weight, as well as by the sliding down of an iron ring. It may again be closed by pulling a double cord which is fastened to the same ring, and thus shifted upwards. Thus the instrument descends with open arms to embrace the body, and by pulling the cords it seizes firm hold of it and is drawn up.

4. A bier of wicker work, in the form of a slanting, oblong basket, for conveying the body of the drowned, in a posture somewhat raised. This simple contrivance has the advantage, that the water may easily run off, while the patient is carried: and, as many unfortunate persons are materially injured by rough treatment, before they arrive at a house of reception, so that their recovery is thus often frustrated, we recommend the universal adoption of this useful implement.

Lastly, we cannot conclude this subject, without affording the reader a view of the different articles belonging to a complete chest of instruments, and other materials, employed in the various processes for recovering suspended animation from drowning, viz.—

A small bottle of rectified spirit of wine. Ditto, white wine vinegar. Ditto, sweet oil. Ditto, white French brandy. Ditto, volatile sal ammoniac. Ditto, vitriolic æther. Ditto, mustard seed. A machine for injecting the smoke of tobacco. A leather tube, together with a pair of bellows, for inflating the lungs. Another tube of leather, for introducing medicines into the stomach. A small syringe for clearing the

throat of mucus. Three woollen covers, or blankets. Four brushes, and six woollen cloths, for performing friction. Several emetics. Two lancets for blood-letting. One pound of tobacco. A roller and cushion, to be used in venesection. Two quills, a sponge, and some lint. A pocket-knife. An apparatus for striking fire. Camomile and elder-flowers. Common salt—and a printed copy of rules and directions for treating the drowned.

OF CONVULSION FITS.

Convulsion fits often constitute the last scene of acute or chronic disorders. When this is the case, there can remain but small hopes of the patient's recovery after expiring in a fit. But, when a person, who appears to be in perfect health, is suddenly seized with a convulsion fit, and seems to expire, some attempts ought always to be made to restore him to life. Infants are most liable to convulsions, and are often carried off very suddenly by one or more fits about the time of teething. There are many well-authenticated accounts of infants having been restored to life, after they had to all appearance expired in convulsions; but we shall only relate the following instance mentioned by Dr. Johnson in his pamphlet on the practicability of recovering persons visibly dead: In the parish of St. Clement's at Colchester, a child of six months old, lying upon its mother's lap, having had the breast, was seized with a strong convulsion fit, which lasted so long, and ended with so total a privation of motion of the body, lungs, and pulse, that it was deemed absolutely dead. It was accordingly stripped, laid out, the passing bell ordered to be tolled, and a coffin to be made; but a neighbouring gentlewoman who used to admire the child, hearing of its sudden death, hastened to the house, and, upon examining the child, found it not cold, its joints limber, and fancied that a glass she held to its mouth and nose was a little damped with the breath: upon which she

took the child in her lap, sat down before the fire, rubbed it, and kept it in gentle agitation. In a quarter of an hour she felt the heart begin to beat faintly; she then put a little of the mother's milk into its mouth, continued to rub its palms and soles, found the child begin to move, and the milk was swallowed; and in another quarter of an hour she had the satisfaction of restoring to its disconsolate mother the babe quite recovered, eager to lay hold of the breast, and able to suck again. The child throve, had no more fits, is growing up, and at present alive. There are many other things which might be done, in case the above should not succeed; as rubbing the body with strong spirits, covering it with warm ashes or salt, blowing air into the lungs, throwing up warm stimulating clysters, or the smoke of tobacco, into the intestines, and such like. When children are dead-born, or expire soon after the birth, the same means ought to be used for their recovery as if they had expired in circumstances similar to those just mentioned. These directions may likewise be extended to adults, attention being always paid to the age and other circumstances of the patient. The means used with so much efficacy in recovering drowned persons are, with equal success, applicable to a number of cases where the powers of life seem in reality to be only suspended, and to remain capable of renewing all their functions, on being put into motion again. It is shocking to reflect, that for want of this consideration many persons have been committed to the grave, in whom the principles of life might have been revived. The cases wherein such endeavours are most likely to be attended with success, are all those called sudden deaths from an invisible cause, as apoplexies, hysterics, faintings, and many other disorders wherein persons in a moment sink down and expire. The various casualties, in which they may be tried, are, suffocations from the sulphureous damps of mines, coalpits, &c. the unwholesome air of long-unopened wells or caverns; the noxious vapours aris-

ing from fermenting liquors; the steams of burning charcoal; sulphureous mineral acids; arsenical effluvia, &c. The various accidents of drowning, strangling, and apparent deaths, by blows, falls, hunger, cold, &c. likewise furnish opportunities of trying such endeavours. Those perhaps who to all appearance are killed by lightning, or by any violent agitation of the passions, as fear, joy, surprise, and such-like, might also be frequently recovered by the use of proper means, as blowing strongly into their lungs, &c.

OF COLD BATHING.

IMMERSION in cold water is a custom which lays claim to the most remote antiquity: indeed it must have been coeval with man himself. The necessity of water for the purpose of cleanliness, and the pleasure arising from its application to the body in hot countries, must very early have recommended it to the human species. Even the example of other animals was sufficient to give the hint to man. By instinct many of them are led to apply cold water in this manner, and some, when deprived of its use, have been known to languish, and even to die. But whether the practice of cold bathing arose from necessity, reasoning, or imitation, is an inquiry of no importance; our business is to point out the advantages which may be derived from it, and to guard people against an improper use of it. The cold bath recommends itself in a variety of cases; and is peculiarly beneficial to the inhabitants of populous cities, who indulge in idleness, and lead sedentary lives. In persons of this description the action of the solids is always too weak, which induces a languid circulation, a crude indigested mass of humours, and obstructions in the capillary vessels and glandular system. Cold water, from its gravity, as well as its tonic power, is well calculated either to obviate or remove these symptoms. It accelerates the motion of the blood, promotes the different secretions, and gives permanent vigour to the solids. But all these

important purposes will be more essentially answered by the application of salt water. This ought not only to be preferred on account of its superior gravity, but likewise for its greater power of stimulating the skin, which promotes the perspiration, and prevents the patient from catching cold. It is necessary, however, to observe, that cold bathing is more likely to prevent, than to remove, obstructions of the glandular or lymphatic system. Indeed, when these have arrived at a certain pitch, they are not to be removed by any means. In this case the cold bath will only aggravate the symptoms, and hurry the unhappy patient into an untimely grave. It is therefore of the utmost importance, previous to the patient's entering upon the use of the cold bath, to determine whether or not he labours under any obstinate obstructions of the lungs or other viscera; and, where this is the case, cold bathing ought strictly to be prohibited. In what is called a plethoric state, or too great a fulness of the body, it is likewise dangerous to use the cold bath, without due preparation. In this case there is great danger of bursting a blood vessel, or occasioning an inflammation of the brain, or some of the viscera. This precaution is the more necessary to citizens, as most of them live full, and are of a gross habit. Yet what is very remarkable, these people resort in crowds every season to the sea-side, and plunge into the water without the least consideration. No doubt they often escape with impunity; but does this give a sanction to the practice? Persons of this description ought by no means to bathe, unless the body has been previously prepared by suitable evacuations. Another class of patients, who stand peculiarly in need of the bracing qualities of cold water, is the nervous. This includes a great number of the male, and almost all the female, inhabitants of great cities. Yet even those persons ought to be cautious in using the cold bath. Nervous people have often weak bowels, and may, as well as others, be subject to congestions and obstructions

of the viscera; and in this case they will not be able to bear the effects of the cold water. For them, therefore, and indeed for all delicate people, the best plan would be to accustom themselves to it by the most pleasing and gentle degrees. They ought to begin with the temperate bath, and gradually use it cooler, till at length the coldest proves quite agreeable. Nature revolts against all great transitions; and those who do violence to her dictates have often cause to repent of their temerity. To young people, and particularly to children, cold bathing is of the last importance. Their lax fibres render its tonic powers peculiarly proper. It promotes their growth, increases their strength, and prevents a variety of diseases incident to childhood. The most proper time of the day for using the cold bath is no doubt the morning, or at least before dinner; and the best mode, that of quick immersion. As cold bathing has a constant tendency to propel the blood and other humours towards the head, it ought to be a rule always to wet that part as soon as possible. By due attention to this circumstance, there is reason to believe, that violent head-aches, and other complaints, which frequently proceed from cold bathing, might be often prevented. The cold bath, when too long continued in, not only occasions an excessive flux of humours towards the head, but chills the blood, cramps the muscles, relaxes the nerves, and wholly defeats the intention of bathing. Hence, by not adverting to this circumstance, expert swimmers are often injured, and sometimes even lose their lives. All the beneficial purposes of cold bathing are answered by one single immersion; and the patient ought to be rubbed dry the moment he comes out of the water, and should continue to take exercise for some time after. When cold bathing occasions chillness, loss of appetite, listlessness, pain of the breast or bowels, a prostration of strength, or violent head-aches, it ought to be discontinued.

OF DRINKING THE MINERAL WATERS.

THE waters most in use for medical purposes in Britain, are those impregnated with salts, sulphur, iron, and mephitic air, either separately or variously combined. The errors which so often defeat the intention of drinking the purgative mineral waters, and which so frequently prove injurious to the patient, proceed from the manner of using them, the quantity taken, the regimen pursued, or using them in cases where they are not proper. Drinking the water in too great quantity, not only injures the bowels and occasions indigestion, but generally defeats the intentions for which it was taken. The diseases for the cure of which mineral waters are chiefly celebrated, are mostly of the chronic kind; and it is well known that such diseases can only be cured by the slow operation of alteratives, or such medicines as act by inducing a gradual change in the habit. This requires length of time, and never can be effected by medicines which run off by stool, and operate chiefly on the first passages. Those who wish for the cure of any obstinate malady from the mineral waters, ought to take them in such a manner as hardly to produce any effect whatever on the bowels. With this view a half-pint glass may be drunk at bed-time, and the same quantity an hour before breakfast, dinner, and supper. The dose however must vary according to circumstances. Even the quantity mentioned above, will purge some persons, while others will drink twice as much without being in the least moved by it. Its operation on the bowels is the only standard for using the water as an alterative. No more ought to be taken than barely to move the body; nor is it always necessary to carry it this length, provided the water goes off by the other emunctories, and does not occasion a chillness, or flatulency in the stomach or bowels. When the water is intended to purge, the quantity mentioned

above may be all taken before breakfast. To promote the operation of mineral waters, and to carry them through the system, exercise is indispensably necessary. This may be taken in any manner that is most agreeable to the patient, but he ought never to carry it to excess. As a purgative, these waters are chiefly recommended in diseases of the first passages, accompanied with or proceeding from, inactivity of the stomach and bowels, acidity, indigestion, vitiated bile, worms, putrid sores, the piles and jaundice. In most cases of this kind, they are the best medicines that can be administered. But, when used with this view, it is sufficient to take them twice, or at most thrice a-week, so as to move the body three or four times; and it will be proper to continue this course for some weeks. But the operation of the more active mineral waters is not confined to the bowels. They often promote the discharge of urine, and not unfrequently increase the perspiration. This shows that they are capable of penetrating into every part of the body, and of stimulating the whole system. Hence arises their efficacy in removing the most obstinate of all disorders, obstructions of the glandular and lymphatic system. Under this class is comprehended the scrophula or king's evil, indolent tumours, obstructions of the liver, spleen, kidneys, and mesenteric glands. When these great purposes are to be effected, the waters must be used in the gradual manner mentioned above, and persisted in for a length of time. It will be proper, however, now and then to discontinue their use for a few days. The next great class of diseases, where mineral waters are found to be beneficial, are those of the skin, as the itch, scab, tetters, ring-worms, scaly eruptions, leprosies, blotches, foul ulcers, &c. Though these may seem superficial, yet they are often the most obstinate which the physician has to encounter, and not unfrequently set his skill at defiance; but they will sometimes yield to the application of mi-

neral waters for a sufficient length of time; and in most cases of this kind these waters deserve a trial.

THE GREEN-SICKNESS.

GREEN-SICKNESS, or *Chlorosis*, is a disorder which frequently attacks females after the age of puberty. It is attended with a depraved appetite, and a desire to eat substances that are not food, such as chalk, ashes, salt, &c.; the skin is pale and discoloured; the face sallow or greenish, but sometimes of a livid hue; there is a deficiency of blood in the veins; with a soft swelling of the whole body, especially the legs during the night; debility; palpitation; and suppression of catamenia.

Causes.—A sedentary life; scanty, or indigestible food; obstructions of the bowels; and frequently inordinate passions.

Cure.—Although the experience of all ages has attested, that the most certain relief in this female complaint is a change from a single to a connubial state, yet as this expedient is not always convenient, the following plan should be steadily pursued: A nourishing diet, with an allowance of generous wine in small quantities; abstinence from acids, spirituous liquors, and whatever may suddenly heat or cool the body; moderate daily exercise, especially on horseback; or, if that cannot be procured, general friction of the whole frame with warm flannel every morning and evening; sleeping on mattresses, instead of soft feather-beds; early rising, and cheerful company. Besides these general regulations, it will be useful to keep the bowels continually open, by taking small doses of vitriolated tartar, a scruple or half a drachm to be repeated four or six times when necessary in one day; to bathe the lower extremeties frequently in warm water, and to wear worsted stockings in preference to silk or cotton; to apply the steam of hot water with due precaution; and lastly, to resort to

the tepid bath every other day, or as often as is compatible with the strength of the patient.—If, nevertheless, these gentle means prove unsuccessful, the more powerful remedies, such as chalybeates, bitters, mercurials, &c. must be prescribed by the profession.—In some of the most tedious and inveterate cases of chlorosis, almost immediate relief was obtained by inhaling dephlogisticated air, or oxygen gas, which however, should be administered only by persons sufficiently acquainted with the nature of that powerful agent.

CULPEPER'S DISPENSATORY,

FOR

FAMILY USE;

Containing a choice Selection of invaluable Prescriptions for almost all Diseases incident to the Human Body.

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AROMATIC OR SPICE WATER.

TAKE of white canella, half a pound; fresh outward peel of lemons, four ounces; lesser cardamum seeds, two ounces: French brandy, two gallons. Let them steep together for four days; and then distil off two gallons.

This is a warm serviceable cordial; for it gratefully invigorates the animal spirits, stimulates the nerves, and thus dissolves cold viscid humours, and expels flatulencics. It is an excellent stomachic, helps digestions, and stops vomiting; and as a carminative is used in the rougher cathartics. Half a wine-glass of it is a dose in windy and painful complaints of the stomach and bowels, and to be repeated occasionally.

PLAGUE AND FEVER WATER.

Take roots of master-wort, a pound and a half; angelica seeds, half a pound; elder flowers, leaves of scordium, of each four ounces; French brandy, three gallons. Steep them together for the space of four days; and then draw off, by distillation, two gallons and a half.

The ingredients are well chosen for the purposes intended, being designed as a high cordial in very low and languid cases, and to raise the spirits in the plague and malignant fevers with depressions. If a fifth part of distilled vinegar be added, it is then termed *aqua epidemia acida*, which is a very powerful sudorific, and resister of putrefaction, in all pestilential and other putrid fevers.

EYE-WATER.

Take white vitriol, half a pound; water, four pints. Boil them until the vitriol is dissolved, and then filter the liquor for use.

This is calculated to cool and repel those sharp rheums and inflammations which sometimes fall upon the eyes, where the vessels being weak and thin, are often unable to resist duly the impulse of the blood, unless they are constringed and strengthened by some such collyrium. It is likewise good to clear them of beginning films and specks. If it should prove too sharp for tender eyes, it may be diluted with a little spring or rose water.

ANODYNE BALSAM.

Take of saponaceous balsam, or opodeldoc, a pound and a half; of liquid laudanum, half a pound. Mix them for use.

This is certainly an extremely penetrating and resolvent anodyne, both for internal and external use, being a most excellent medicine for procuring ease in the extremities of pain, and in nervous and nephritic cholics. It cleanses all the viscera and glandular parts; therefore good in the jaundice and such distempers of the urinary passages, as proceed from the obstruction of gravel or slimy humours. Inwardly it may be given from twenty to forty drops. And outwardly applied to the pained part, does mighty service, a rag being dipped in it, and retained thereon.

ALEXETERIAL BOLUS.

Take of Virginian snake-root fifteen grains: of castor, ten grains; of camphor, three grains; syrup of sugar, enough to mix and make them into a bolus.

This is a powerful alexipharmic, and is given in most kinds of fevers, especially the worst and more malignant sort, attended with convulsions and deliria. It is hardly ever omitted, when the pulse and spirits begin to flag in the progress of a putrid fever, small pox, measles, miliary fever, &c. It is good in nervous and paralytic cases, which proceed from too much humidity; as also in the febricula, whether hysterical or hypochondriacal. If plentifully prescribed, it requires to be well diluted with small liquors; and thus managed it seldom fails of raising a diaphoræsis, and bringing the distemper to a crisis.

DIAPHORETIC BOLUS.

Take of compound powder of contrayerva, and of crude salt of ammoniac, each one scruple; syrup of sugar, as much as is sufficient to make a bolus.

This penetrates into the most intimate parts, and is a noble aperient, sudorific, antiseptic, and diuretic. Hence it becomes proper, in cases where perspiration is to be augmented; and in fevers in which the disorder is to be eliminated by the cuticular discharges. It is prescribed, with a draught of the plague water, to remove cachectic and anasarcous swellings.

BOLUS OF JALAP WITH MERCURY.

Take of choice jalap, one scruple; calomel, from five to ten grains; syrup of sugar a sufficient quantity. Mix them together into a bolus.

This is a proper bolus in most cases where a brisk purgative, preceded by a clyster, is necessary, either

to make a revulsion after bleeding in inflammatory swellings and obstructions of the parts contained in the head, neck, or thorax; or to make an evacuation of the intestines and adjacent viscera of the abdomen. Thus may a bilious fever be carried off, when it has lingered, and there is little probability of its ending critically by any other way; as a diaphoretic and hydrogogue, it is of use in dropsies, defluxions of the head, eyes, and ears; as also in humoral coughs, and many obstinate chronical distempers. It destroys worms, cures a violent gonorrhœa and fluor albus. It is also good to cleanse the bowels from their redundant viscid mucus, that often clogs or shuts up the chylopoietic system, so as to hinder the entrance and proper effects of other medicines. In intermitting fevers it is a specific.

A PECTORAL BOLUS.

Take of spermaceti, fifteen grains; of gum ammoniacum, ten grains; of the volatile salt of hartshorn, seven grains. Mix and make them into a bolus.

This is an excellent balsamic in many distempers of the breast; and gently deterges and heals. In coughs, pleurisies, and inward imposthumations, where the mucus of the bowels has been abraded by acrimony, and choler; as also in diarrhœas and dysenteries, this is a very good healer. In ulcerations of the kidneys and bloody urine, it is likewise a very suitable medicine; and by softening and relaxing the fibres, it contributes frequently to the expulsion of gravel. It may be taken once or twice a-day, with some proper emulsion, draught or julep, according to the indications.

THE RHUBARB BOLUS WITH CALOMEL.

Take of the best purgative rhubarb, twenty-five grains; of calomel five grains. Mix and make them into a bolus with as much syrup of sugar as will suffice.

This is an admirable medicine in most cases where purging is necessary, to cleanse the first passages of any thing that hinders the successful operation of other alterative medicines. See the virtues of the Jalap Bolus, which this nearly answers, but is more astringent, hepatic, stomachic, and a purger of the urine and sabulous concretions.

EMOLLIENT CATAPLASM.

Take of the crumb of bread, eight ounces; white soap, one ounce; fresh cow's-milk a sufficient quantity. Boil them a little, and spread for use.

This is anodyne, penetrating, and resolvent: therefore applied to the soles of the feet in fevers, to the joints when afflicted with the gout, and causes sometimes the exudation of a great quantity of serous matter; and to white swellings.

SUPPURATING CATAPLASM.

This is made by adding to the foregoing cataplasm, of raw onions bruised, one ounce and a half; basilicon ointment one ounce.

This is good to draw and suppurate all kinds of tumours; and to ripen, break, and cleanse, imposthumations.

APERIENT ALE.

Take of old mustard-seed, ten ounces: long birthwort root, six ounces; tops of lesser centaury, two ounces; savin, one ounce; new small ale ten gallons.

This cleanses the womb, excites the menstrual discharges, and forwards delivery. It is serviceable in hysterical disorders, and good to loosen and discuss viscidities; and, therefore, excellent in all paralytic cases, and the decays and defluxions attending old age.

CEPHALIC ALE.

Take of wild valerian root, two ounces; whole mustard-seed, six ounces; Virginian snake-root, two ounces; rosemary, or sage, three ounces; new small ale ten gallons

This is good against epilepsies, apoplexies, palsies, and all diseases of that kind, and vertigoes from uterine obstructions; it is also of use in almost all nervous complaints; especially such as arise from too great moisture and cold.

STRENGTHENING CONFECTION

Take of bole-ammoniac prepared, three ounces; tormentil roots, nutmegs, olibanum, of each two ounces; opium, one drachm and a half; syrup of dry roses, thrice the weight of the powders. Mix them according to art.

This alexipharmic, anodyne, and astringent, vulnerary, is recommended in immoderate evacuations of the abdomen. A drachm or two of it, at a dose, along with the chalk julep, will give an effectual check to the dissorder. It is successfully prescribed for diarrhœas in the measles, small pox, or fevers; as also for relaxations, hæmorrhages, and hurts in the time of pregnancy: and likewise for the *fluor albus*, and seminal weakness.

ANTITHECTIC DECOCTION.

Take of the roots of comfrey, eringo, each half an ounce: conserve of roses, two ounces; water, three pints. Boil these ingredients together, till there remains a quart of liquor after straining; to which add of sweet spirit of vitriol, forty drops.

This is grateful and strengthening; it restrains the saline particles of the blood, and hinders it from rushing too impetuously through the lungs; therefore it takes place in newly-begun comsumptions, hectic fevers, night sweats, &c. where the colliqua-

tion of the humours causes a wasting of muscular parts.

COMMON DECOCTION.

Take of mallow leaves, camomile flowers, each one ounce; water, two quarts. Boil till one quart of the liquor is wasted: then strain out the remaining decoction for use.

This is emollient and carminative, therefore accounted a good anodyne, and excellent against gripes, nephritic pains, stranguries, and heat of urine; as also for cramps, and such like spasms. It is likewise used in lotions and clysters.

THE DIURETIC DECOCTION.

Take of the roots of parsley, or those of fennel, one ounce; seeds of wild carrot, three drachms; pellitory of the wall, half an ounce; raisins of the sun, two ounces; water, three pints. Boil them together, till there remains a quart of liquor after straining; to which add, of nitre, one drachm.

This abstergeth much slime and viscid adhesions from the stomach and bowels; cleanses the viscera, particularly the kidneys; keeps the juices cool and fluid; and greatly assists their discharge by urine, especially in uterine and hysteric cases.

VULNERARY DECOCTION.

Take of the herb groundivy, leaves of plantain, each half an ounce; water, three pints. Boil them till there remains a quart of liquor after straining; to which add, of white sugar, half an ounce.

This is cooling, abstersive, and vulnerary; and, prescribed as an astringent in distempers of the lungs, chiefly for such consumptions as proceed from sharp thin humours, weaknesses, and spitting of blood.

ANTIDYSENTERIC ELECTUARY.

Take of the strengthening confection, one ounce;

balsam of Lucatellus, (dissolved in the yolk of an egg,) half an ounce. Mix them together.

This is an excellent internal vulnerary in an obstinate bloody flux, to prevent abortion, &c., and very aptly formed for corresponding with such purposes. The confection has its share in accomplishing a cure, partly from its astringency, partly from its opiate quality, by rendering the vessels insensible of the pungency of the morbific particles; while the virtues of the balsam agglutinate, heal, and stop up, the mouths of the vessels, and sheath the acrimonious humours which abrade the parts.

BALSAMIC ELECTUARY.

Take of conserve of roses, two ounces; balsam of Lucatellus, (dissolved in the yolk of an egg,) one ounce. Mix, and make them into an electuary.

This is a noble medicine, easy to take, and ought to be repeated on the urgency of such coughs as give suspicion of tubercles, ulcerations, and decays of the lungs. It dissolves tough phlegm in the bronchia, cures catarrhs and coughs from tickling defluxions; it repairs and heals inward exulcerations and bloody discharges, especially of the kidneys, bladder, and uterus. In seminal weaknesses, old gleets in both sexes, there can be nothing better contrived. The quantity of a nutmeg may be taken two or three times in a day, with a draught of the antihectic decoction.

CEPHALIC ELECTUARY.

Take of wild valerian-root, misletoe of the oak, each one ounce; syrup of sugar, a sufficient quantity. Mix them into an electuary.

This is calculated for disorders of the head, and is in great esteem for epilepsis and inveterate head-aches. It is frequently prescribed in apoplexies, vertigoes, and convulsions, from uterine obstructions.

ELECTUARY AGAINST THE PILES.

Take of lenitive electuary, two ounces; sulphur vivum, half an ounce. Make thereof an electuary.

The quantity of a nutmeg is to be taken of this every morning and night; it will keep the belly moderately lax, and greatly ease the piles.

LENITIVE ELECTUARY.

Take three ounces of polypody-roots, and three quarts of water. Boil till two quarts are wasted; adding, towards the end of the decoction, two ounces of senna, and half an ounce of coriander seeds. Strain out the liquor, add to it four pounds of white sugar, and boil to the consistence of a thick syrup; with which mix a pound of the pulp of French prunes: half a pound of the pulp of cassia, and the same quantity of tamarinds. Make the whole into an electuary.

This cools and purges very gently, and is convenient enough to add in clysters. Internally, it is more proper to prevent costiveness than to be exhibited as a regular cathartic. It is also intended to cleanse the liver and other viscera.

STRENGTHENING ELECTUARY OF BARK.

Take of Peruvian bark one ounce and a half; colcother of vitriol, three drachms; syrup of sugar, a sufficient quantity. Make them into an electuary.

In robust constitutions this is prescribed for stubborn agues; and also for fluxes and hæmorrhages. It promotes discharges by urine, destroys worms, brings them away, and strengthens the fibres; but in thin hectical habits it is not so proper. The colcother here prevents the bark from going off by stool, which it is sometimes apt to do; and opium likewise will have the same effect.

ELECTUARY AGAINST FLUXES.

Take of the strengthening confection, two ounces;

extract of logwood, one ounce; syrup of dry roses, a sufficient quantity. Make them into an electuary.

This is an astringent, and good to fortify the stomach and bowels when weakened by a diarrhœa; and is much esteemed of late for its virtues in curing a dysentery.

WARM PLASTER.

Take of gum plaster, one ounce; blistering-plaster, two drachms. Melt them together over a gentle fire.

The chief intention of this is to raise blisters, and to create a stimulus in a languor or stupor of the nervous system; to dissolve a viscosity or siziness of the juices, and hinder their tendency to a coagulation; or to cause a derivation and discharge of some morbific humour, and prevent its returning into the blood; therefore it is esteemed useful in some inflammatory fevers, dropsies, and certain stages of the crystalline or watery small pox; especially if the pustules subside, and the extremely viscid matter of the disease can neither be brought to suppurate, nor be carried off by diuretics. It remarkably affects the kidneys and bladder, and provokes urine, not by an easy natural ejectment, but rather by an erytismus from its acrid salts that cause a strangury, which should be guarded against by broths and emulsions. It is good against a mortification, and reckoned an efficacious cleanser and scourer of the urinary passages and uterus, when obstructed with slough and viscidities. But its use requires the highest caution and prudence; hence it is not every one who must think himself qualified to meddle, without distinction, with remedies, which are sure to do good or hurt according as they are administered.

COMMON PLASTER.

Take of litharge prepared, three pounds; oil of olives, six pounds. Boil them up to a due consistence.

This is to supply the place of the diachylon plaster of former dispensatories; and is esteemed more emol-

lient, muturant, and resolvent. It will also incarnate and cicatrize.

DEFENSIVE PLASTER.

Take of litharge prepared, two pounds; oil of olives, four pounds. Boil them almost to the consistence of a plaster, in which qualify six ounces of yellow wax, and four ounces of olibanum. Then add six ounces of bole ammoniac prepared, two ounces of dragon's blood in powder, and four ounces of Venice turpentine.

This is employed to consolidate fractures, to strengthen luxations and weaknesses of the loins and joints; and is also serviceable for ruptures and chilblains.

BLISTERING PLASTER.

Take of Burgundy pitch, twenty ounces; Venice turpentine, cantharides in powder, each six ounces.

This is a powerful epispastic, and is applied either to the head, between the shoulders, or to the soles of the feet. See its use in the Warm Plaster. But when applications are made to the feet, with an intent to stimulate strongly, excite pain therein, and relieve the head, cataplasms composed of equal parts of scraped horse-radish and powdered mustard-seed, moistened with old yeast, will answer the design expeditiously, strongly, and effectually.

MERCURIAL PLASTER.

Gum plaster is substituted here for diachylon.

This admirably warms, softens, and discusses, all indurations and hardened tumours, be they chalky, scrophulous, or veneral.

STOMACH PLASTER.

Take of yellow wax, eight ounces; tacamahaca in powder, palm oil, each four ounces. Melt them together, and add of cloves in powder, two ounces; expressed oil of mace, one ounce and a half. Mix, and

make them into a plaster, which is to be moistened, when fresh spread, with some drops of distilled oil of mint.

This is intended as a warm carminative, and cordial application to the stomach, and exerts very considerable effects when such thinge are wanted; therefore it is useful in flatulencies, gripes, and all complaints arising from indigestion; and a cold weak stomach cannot weil fail finding relief from its use.

COMMON EMULSION.

Take of sweet almonds, one ounce; water, one quart. Make them into an emulsion; to which add of white sugar, two drachms. If three drachms of gum arabic be previously boiled in the water, the preparation is called Arabic Emulsion.

Either of these is singularly useful in many emergencies; particularly in acute distempers, and the gravel. In heat of urine and stranguries, either from acrimonious humours or the salts of epispastics, they give immediate ease; and ought to be drunk while fresh, half a pint at a time, and pretty often. There are other sorts of emulsions, which are calculated for diuretics, coolers, and pectorals.

ANODYNE CLYSTER.

Take of the infusion of linseed, six ounces; liquid laudanum forty drops. Mix them together.

This is excellent to assuage pains in dysenteries, and inflammations of the uterus and bladder, by reason of a proximity and consent of parts.

ANTICHOLIC CLYSTER.

Take of the common decoction, half a pint; tinctura sacra, one ounce; common salt, one drachm; linseed oil, two ounces. Mix them together.

This falls in with the view of unloading the bowels of their costive contents, and consequently procures an immediate relief on many occasions, chiefly in fla-

tulencies, gripes, and bilious cholics. The addition of the salt, by a mild gentle stimulus, insures its effects. It likewise destroys worms, particularly the ascarides, if assisted with a few grains of calomel by the mouth.

THE PURGING CLYSTER.

Take of the common decoction, half a pint; white soap, one ounce; syrup of buckthorn, an ounce and a half. Mix them according to art.

This is penetrating, detersive, and capable of dissolving indurations and grumous viscidities of the intestinal tube, especially in the jaundice, and by ridding the bowels of their concreted contents may prevent an inflammation. It is useful in disorders of the head, and may cause a revulsion in the fæculent vomitings.

EXPRESSION OF MILLEPEDES.

Take of live millepedes, (commonly called woodlice,) three ounces; simple fennel-water, one pint; compound horse-radish water, half a pint. Bruise the millepedes, gradually adding to them the distilled waters; and afterwards press out the liquor.

This is an excellent diuretic, sweetener and cleanser of the blood, and a most efficacious medicine in all chronic cases, that are to be relieved by promoting the urinary discharges, as are many inveterate ulcers, strumas, and scrophulous disorders, and such as frequently are the forerunners of scorbutic dropsies, from a retention of such humours as obstruct the viscera, and fill the whole habit with water and viscidities. Hence it is of singular efficacy in the stone, jaundice, nephritic pains, dysury, cholic and athma.

AROMATIC FOMENTATION.

Take of cloves, mace, each one drachm; red wine, one pint. Boil them a little, and then strain out the liquor.

This, applied warm to the abdomen, will be found of admirable service in cholics, and for relaxed weak stomachs that are subject to distention from flatulency. It may be used to the head with success in any disorders from too much moisture and pituitous defluxions.

STRENGTHENING FOMENTATION.

Take of oak-bark, one ounce; pomegranate-peel, half an ounce; forge-water three pints. Boil them till there remains a quart of the strained liquor; to which add of roch-alum, two drachms.

This is proper for hæmorrhages, whether uterine, hæmorrhoidal, or from any other part. It is also good to foment sprains, fractures, or paralytic limbs; and will help to check immoderate vomitings.

THE COMMON GARGLE.

Take of water, six ounces; nitre, one drachm; honey of roses, one ounce. Mix them together. To this gargarism are sometimes added, of sweet spirit of vitriol fifteen drops.

This is proper to cleanse and scour the mouth and throat from slough, and the phlegmatic matter which stuffs and tumefies the glands. It is also good to cool and deterge the mouth when sore, parched, and dry with a fever.

EMOLLIENT GARGLE.

Take of marsh-mallow roots, two ounces; figs in number four; water, three pints. Boil till there remains one quart of liquor, which strain out for use.

This is excellent to assuage pain and inflammation in the throat or mouth, to maturate any ulcer therein, and mollify the blistered tongue and fauces in a a salivation. The learned and accurate Sir John Pringle observes, that in the inflammatory quinsy, or strangulation of the fauces, little benefit arises from

the common gargles; that such as are of an acid nature do more harm than good, by contracting the emunctories of the saliva and mucus, and thickening those humours; that a decoction of figs in milk and water has a contrary effect, especially if some sal-ammoniac be added; by which the saliva is made thinner, and the glands brought to secrete more freely; a circumstance always conducive to the cure.

SALINE DRAUGHT.

Take salt of wormwood, one scruple; lemon-juice, half an ounce; white sugar, one drachm. Mix them together.

This is an effectual remedy to stop vomitings, and is of singular use in fevers, especially those of the intermittent kind, when the bark often fails. It causes gentle breathing sweats, and may be repeated every five or six hours occasionally.

ANTISCORBUTIC INFUSION.

Take of water trefoil, two ounces; oranges, half-an ounce; boiling water two quarts. Let them stand in infusion for a night in a close vessel; afterwards strain the liquor, and then add to it of compound horse-radish water, half a pint.

This is effectual against scrophulas, the king's evil, and all obstinate scorbutic diseases. In the rheumatic, dropsical, and cachectic, habits, it will be of good service. It likewise gives due warmth to the nerves, which in paralytic cases they are destitute of. It may be drunk at discretion, and the use of it continued according to the exigency of the disorder.

INFUSION OF LINSEED.

Take of linseed, two spoonfuls; liquorice-root sliced, half an ounce; boiling water three pints. Let them stand to infuse by the fire for some hours, and then strain off the liquor.

If an ounce of the leaves of colt's foot be added to these ingredients, it will then be the pectoral infusion. Both these are emollient mucilaginous liquors, and may be taken with advantage as ordinary drink in difficulty of making water; and in coughs and other complaints of the breast.

BALSAMIC INJECTION.

Take of balsam copaiba, half an ounce; the yolk of one egg. Work them well together, and gradually add of lime-water, six ounces; honey of roses, two ounces. Mix the whole well together.

This is excellent for the consolidation of wounds, and to cleanse and heal ulcerations, gleets, and seminal weaknesses, if used two or threee times a-day; and for corroborating the nervous parts, which have been relaxed by the disease.

THE MECURIAL INJECTION.

Take of quicksilver, balsam copaiba, each half an ounce. Beat and work them together, till the quicksilver is extinguished; then put to the mass the yolk of an egg. Mix the whole very well together, gradually adding of rose water, half a pint.

This is calculated for gonorrhœas, and venereal ulcers in the urethra, vagina, and uterus; the quicksilver destroys the virulency, while the balsam heals and sheathes the excoriated parts from the acrimony of the urine.

THE CORDIAL JULEP.

Take of alexeterial water, four ounces; aromatic water, two ounces; saline aromatic spirit, tincture of saffron, each two drachms; white sugar half an ounce. Mix and make them into a julep.

This is a high cordial, and will bring on an effectual moisture; consequently remove all weariness, heat, and tension of the parts; therefore it is of great service in the depressed state of fevers, fatigue from

excesses and lowness of spirits. A few spoonfuls drunk every three or four hours, will by its enlivening quality, communicate an agreeable sensation. It is likewise very aptly prescribed with powder and boluses

DIAPHORETIC JULEP.

Take of alexeterial water, four ounces; spirit of mindereus two ounces; volatile salt of hartshorn, ten grains; syrup of meconium, one ounce. Mix them together.

In slow malignant fevers, with cold clammy sweats pale visage, a low intermitting pulse, and where great restlessness prevails, this julep will be singularly beneficial. A tea-cup full may be given and repeated every four or five hours, till some crisis appears, and the distemper abates.

DIURETIC JULEP.

Take of spirit of mindereus, four ounces; compound horse-radish water, two ounces; syrup of marsh-mallows, three ounces. Mix, and make a julep; to which may be added occasionally, of spirit of amber, one drachm.

This is strongly diuretic; hence a good remedy against a suppression of urine from any cause, the gravel and nephritic pains. It will also promote and assist an urinary crisis; and may be repeated as the urgency of the symptoms indicates.

THE FETID JULEP.

Take of rue water, six ounces; assafœtida, one drachm and a half. Dissolve the assafœtida in the water, and add to the solution, of antihysteric-water, two ounces; distilled oil of hartshorn, twenty drops, received upon ten drachms of white sugar. Mix the whole well together.

This is ordered in hysteric affections, and a defective state of the menses and sometimes in hypochon-

driachal cases. A tea-cupful may be taken three or four times a-day.

THE SALINE JULEP.

Take of mint-water, syrup of lemons, each two ounces; salt of wormwood, one drachm. Make them into a julep.

This is an admirable remedy in vomitings and hiccups. It has a mild and innocent virtue, though powerfully attenuating and resolving, diuretic, and sudorific: hence it is excellent in rheumatisms, fevers, and all disorder from a siziness of the blood. Two or three spoonfuls are given every five or six hours.

THE ANODYNE LINIMENT.

Take of nerve-ointment, three ounces; balsam of turpentine, one ounce. Mix them together.

This is a warm invigorating tonic, and may be used with good effect, to excite the nerves to action when too languid. It is applied to paralytic and numbed limbs, to restore a due sense and feeling; and, by its penetrating quality, it is of good use in the sciatica and the gout.

PECTORAL LOHOCH.

Take of spermaceti, white soap, each two drachms; whites of eggs, a sufficient quantity. Mix them thoroughly together, and then add of fresh drawn linseed oil, one ounce and a half; syrup of marsh-mallows, three ounces. Mix the whole well together.

This contains very great emollient and balsamic virtues; and by the inciting and detergent property of soap, becomes a powerful deobstruent in infractions of the breast; hence it is recommended in a difficulty of respiration, either from a dry husky cough, or a tough thick phlegm: and likewise in imposthumations and tubercles of the lungs.

ALOETIC PILLS.

Take succotrine aloes, white soap, of each equal parts; thin honey, as much as is sufficient. Make them into a mass.

The soap is here added purely to promote the dissolution of the aloes in the stomach; for pills made up of raisins, and substances not easily dissoluble, frequently pass through the body entire; hence by the purgative quality of the aloes, and detergent property of the soap, the glairs and viscidities of the intestines are dissolved and carried off; therefore the pills are stomachic, antefebrile, and excellent in nephritic and cholic pains—Moreover, the aloes being hepatic, forward the discharge of the bile, whilst, by the concomitancy of the soap, it breaks the obstructions of the liver, blends and assimilates the humours. Hence it appears how advantageous and essential it is to adapt and combine medicines judiciously.

PURGING ECPHRATIC PILLS.

Take succotrine aloes, extract of black hellebore, scammony, of each two ounces; vitriolated tartar, three drachms; distilled oil of juniper, a drachm and an half; syrup of buckthorn, as much as is sufficient to make the whole into a mass.

These are an excellent hydragogue, particularly in cachectic and scorbutic habits abounding with dropsical humours. Three or four of these may be taken once a-day, or every other day, and continued according to the exigency of the complaint.

MERCURIAL PILLS.

Take of purified quicksilver and honey, each half an ounce. Rub them together in a mortar, till the globules of mercury are perfectly extinguished; then add of Castile soap, two drachms; powdered liquorice or crumb of bread, a sufficient quantity to give the mass a proper consistence for pills.

When stronger mercurial pills are wanted, the quantity of quicksilver may be doubled. The dose of these pills is different, according to the intention with which they are given. As an alterant, two or three may be taken daily. To raise a salivation, four or five will be necessary. Equal parts of the above pill, and powdered rhubarb made into a mass, with a sufficient quantity of simple syrup, will make a mercurial purging pill.

MERCURIAL SUBLIMATE PILL.

Dissolve fifteen grains of the corrosive sublimate of mercury in two drachms of the saturated solution of crude sal ammoniac, and make it into a paste, in a glass mortar, with a sufficient quantity of the crumb of bread. This mass must be formed into one hundred and twenty pills.

This pill, which is the most agreeable form of exhibiting the sublimate, has been found efficacious, not only in curing the venerial disease, but also in killing and expelling worms, after other powerful medicines had failed. For the venerial disease, four of these pills may be taken twice a-day, as an alterant, three, and for worms two.

PACIFIC PILLS

Take of galbanum, myrrh, white soap, of each two ounces; opium, one ounce; syrup of sugar, as much as is sufficient to make the whole into a mass fit for pills.

These are admirable in assuaging hypochondriacal and hysteric complaints, nephritic and uterine pains, caused either from obstructions, or ulcers in the kidnies or uterus.

THE PECTORAL PILLS.

Take of gum ammoniacum, an ounce and a half; myrrh, one ounce; balsam of sulphur terebinthinated, one drachm; syrup of marsh-mallows, as much as will make the whole into a mass.

These are healing and balsamic in a hæmopthisis infractions, and ulcers of the lungs.

STOMACHIC PILLS.

Take of succotrine aloes, an ounce and a half; gum ammoniac, myrrh, each half an ounce; vitriolated tartar, two drachms; distilled oil of mint, half a drachm; syrup of sugar, a sufficient quantity. Mix according to art.

These, by their cathartic, bitter, attenuating, and aromatic qualities, incite and purge away sloughy humours, which foul the coats of the stomach; also warm and fortify the fibres, whereby the gastric juice and digestion are promoted. They are most convenient in an advanced age, and full cachectic habits, which abound with cold viscid humours. They may be taken five or six at a dose.

THE BALSAMIC POTION.

Take of balsam copaiba, three drachms; distilled oil of juniper, three drops; the white of an egg; work them well together, and mix in, of fennel-water, compound horse-radish water, each three ounces; syrup of marsh-mallows, two ounces.

This is vulnerary and diuretic; hence chiefly of use in wounds, ulcers, and weaknesses, of the kidneys and uterus.

LITHONTRIPTIC POTION.

Take of white soap, (the outward part being pared off) one ounce; warm lime-water, one quart. Stir them together till the soap is perfectly dissolved.

This, by its penetrating, and alkaline virtues, is intended for the gravel and stone, which it dissolves and prevents by assimilating the humours, and by absorbing those acidities which form calculous concretions.

COMPOUND SPIRIT OF LAVENDER.

Take flowers of lavender, fresh gathered, a pound and a half; fresh flowers of rosemary, half a pound; fresh outward part of lemon-peel, three ounces; rectified spirit of wine, a gallon and a half. Distil in balneo mariæ to dryness. In the distilled spirit steep for two days, of cloves, cubebs, and shavings of red saunders, each two ounces; then strain out the spirit for use.

POWDER FOR EPILEPTIC AND CONVULSION FITS.

Take flowers of zinc, musk, and factitious cinnabar, of each equal parts; mix them together in a glass or marble mortar. The dose is from three grains to ten and upwards, mixed in a little treacle or honey, every night and morning.

The use of this powder, with dipping children in a tub of spring water every morning, has very often relieved them, when every other remedy has proved abortive.

PURGING POWDERS FOR WORMS.

Take of scammony, calomel, and the best Turkey rhubarb, in powder, of each equal parts; double-refined sugar, the weight of the whole; rub it all very well together in a marble mortar, and keep for use.

The dose for children is from ten grains to twenty-five, once or twice every week. This is preferable to any quack-medicine whatever.

A UNIVERSAL POWDER FOR CHILDREN'S DISORDERS.

Take of white magnesia, six drachms; cinnabar of antimony, two scruples; mix them into a fine powder for use.

This powder will not only prevent the numerous disorders children are liable to, but will also remove many, and all that arise from acidities in the sto-

mach.—This is preferable to all other remedies yet known, for children in cutting their teeth, sickness at their stomachs, &c. &c. The dose is from ten grains to half a drachm, more or less, twice a day.

POWDER TO PROMOTE DELIVERY.

Take borax in fine powder, castor, cinnamon, and myrrh, of each three drachms; saffron and savin, of each one drachm and a half; mix them and make a powder for use.

A drachm of this powder facilitates the birth, and promotes the lochia and menses.

THE FAMOUS SYMPATHETIC POWDER.

Take of green vitriol, eight ounces; of gum tragacanth reduced to an impalpable powder, one ounce; mix these together, and let a small quantity of the powder be sprinkled on the wound, and it immediately stops the bleeding. The vitriol must be calcined to whiteness in the sun, before it be mixed with the gum.

The above powder is used by the miners at Gosselaer in Germany, in all their wounds, and, I believe, was never known to fail. This powder, Mons. Lemery and Sir Kenelm Digby tells us, has also the following wonderful property, that, if it be spread on a cloth dipped in the blood of a wound so as to incorporate with the blood, the wound would be cured, though the patient were miles off, and never saw the medicine. From this remarkable sympathetic property it derived its name.

POWDER FOR A SORE THROAT.

Take an ounce and a half of purified sal ammoniac, and half an ounce of purified nitre, mix them very well together in a mortar for use.

About six or eight grains of this powder is to be frequently held in the mouth, and to be gently swallowed down the throat. This very often answers

better than gargles. If necessary, lose a little blood, and take a brisk purge before you use the powder.

FOR VOMITINGS, BILIOUS DISORDERS, &c.

Take mint-water, syrup of lemons, of each four ounces; salt of wormwood, two drachms. Mix them well together for use.

In vomitings, hiccups, rheumatisms, fevers, and all disorders from a siziness of the blood, no preparation can be more innocent nor more efficacious. Two or three table spoonfuls are to be taken every four or five hours.

DECOCTION FOR CATARRHS, COLDS, &c.

Take of compound testaceous powder, one ounce; gum arabic, in powder, half an ounce; water, two quarts; boil it till one pint of the water is wasted: then add to the turbid decoction, of aromatic water, one ounce and a half; white sugar, half an ounce, and mix the whole well together for use.

This composition will be found immediately useful in destroying sharp corrosive matter in the stomach, and absorbing all acidities in the first passages. Half a pint of it in fevers, colds, or the like disorders, may be taken three or four times every day, blood-warm.

SWEATING DRAUGHT, FOR RECENT COLDS.

Take the spirit of mindereus, four ounces; syrup of poppies, and simple cinnamon-water, of each one ounce; volatile salt of hartshorn, half a seruple. Mix them together for two draughts, and take one of them when going into bed, and the remainder the second evening after.

In rheumatisms, pains in the head, and other parts, the above sweating draught will be found to answer every intent.

FOR AN INVETERATE COLD OR COUGH.

Take a large tea-cupful of linseed, two-pennyworth of stick-liquorice, and a quarter of a pound of sun-rasins.—Put these into two quarts of soft water, and let it simmer over a slow fire till it is reduced to one; then add to it a quarter of a pound of brown sugar-candy pounded, a table-spoonful of old rum, and a table-spoonful of the best white wine vinegar or lemon-juice. The rum and vinegar are best to be added only to that quantity you are going immediately to take; for, if it be put into the whole, it is apt, in a little time, to grow flat. Drink half a pint at going to bed, and take a little when the cough is troublesome.

This receipt generally cures the worst of colds in two or three days, and if taken in time may be said to be almost an infallible remedy. It is a sovereign and balsamic cordial for the lungs, without the opening qualities which endanger fresh colds by going out. It has been known to cure colds that have been almost settled in consumptions, in less than three weeks.

FOR A PUTRID SORE THROAT.

Take of the best Peruvian bark, in gross powder, one ounce and a half; Virginian snake-root, three drachms: boil them together in three quarts of water to one quart; then strain the liquor, and add two drachms of elixir of vitriol; take a large tea-cupful of it every third hour. To every dose you may add a small quantity of brandy if you choose it.

The steam of the following ingredients received into the throat through a funnel every hour will do a deal of service.

Take vinegar, one pint; honey, half a pound; myrrh, in powder, half an ounce; boil them well together, and it is fit for use.

Blisters applied to the throat and behind the ears,

are equally beneficial in this disease, in case the pulse and spirits are very low. If a vomiting continues, take four table-spoonfuls of lemon juice, and put to it one drachm of salt of tartar; white sugar, half an ounce; mint-water, three ounces; mix them very well together. The dose is a table-spoonful every hour. —This is the famous saline julep so much approved of by the faculty, as an antidote against vomiting and sickness of the stomach. After the disorder is subdued, the patient should take a few purges of rhubarb, senna, or the like. But, on the contrary, whilst the putrid ulcers remain in the throat, and a violent looseness should come on, it must be checked, by taking two tea-spoonfuls of diascordium two or three times a day.

ALE FOR THE INWARD PILES.

Take half an ounce of black pitch, and boil it in a pint of good ale till it comes to half a pint, then drink it off blood-warm.

This, though a simple remedy, has proved very effectual in many stubborn cases, where other things of much greater expense have proved abortive.

ALE FOR THE JAUNDICE.

Take one quart of ale, and add to it two ounces of hemp-seed, and half an ounce of turmeric, in powder: boil them over the fire about a quarter of an hour, then strain it for use.

This may be sweetened with coarse sugar. Half a pint of it at a dose; to be taken every morning.

VOMITING DRAUGHT.

Take of ipecacuanha, in fine powder, twenty-five grains; alexeterial water, half an ounce; compound spirit of lavender, half a drachm; syrup of orange-peel, one drachm; mix them for use.

DRAUGHT FOR THE DROPSY.

Take of peppermint water, one ounce; simple cinnamon-water, half an ounce; spirituous cinnamon-water, two drachms; thebaic tincture, forty drops; lye of tartar, half a drachm; syrup of marsh-mallows, one drachm; mix them together for a draught.

This is the medicine which cured a person labouring under an ascites and tympany at the same time, where the pain was very severe, attended with great thirst, and thick high coloured urine rendered in small quantities. The strong purges increased the distemper. Soap, lixivials, salts, balsam of gilead, nitre, and the like, all proved abortive. This draught brought unexpected relief, by procuring rest, and causing a copious discharge of water. By repeating the medicine for some time, every eight hours, and then only twice a day, and afterwards using corroborants, or medicines that produce strength of body, &c. the cure was perfectly completed.

FOR CONSUMPTIONS.

Take leaves of comfrey the greater, Solomon's seal, and pimpernel, each four handfuls; liquorice-root, two ounces; infuse them cold for twelve days in two gallons of lime-water, and take off the clear liquor for use.

This is very easily made, and is much better than if it were to be distilled. It is of excellent use in such consumptions as proceed from a sharp thin blood; especially in those who have been injured by a certain bad disease, or have any hereditary remains of scrophulous or leprous humours. It must be drunk for about forty days together, to the quantity of a quart or two every day, if the stomach can bear so much. It will also be of the utmost service to wash foul ulcers with.

DECOCTION FOR INWARD DECAY.

Take groundivy, scabious, and colt's-foot, each two handfuls; hyssop, one handful; elecampane-root, one ounce; liquorice, four ounces; agrimony, four handfuls: boil them together in nine quarts of barley-water till they come to about a gallon, then strain it for use.

This pectoral can be depended on in coughs and consumptions of the lungs.

FOR THE ASTHMA AND SHORTNESS OF BREATH

Take of the milk of gum ammoniac, six ounces; syrup of squills, four ounces and a half: mix them together.

This promotes expectoration in a very great degree, and relieves those who are short-breathed; it is also justly esteemed for its serviceable properties in asthmatic cases, by rarefying and thinning viscid cohesions in the pulmonary vessels. A spoonful is to be taken four or five times every day, and in particular every morning.

INJECTIONS FOR ULCERS IN THE VAGINA AND WOMB.

Take quicksilver, balsam capivæ, of each half an ounce: beat and work them together, till the quicksilver is extinguished: then put to the mass the yolk of an egg; mix them very well together, gradually adding half a pint of rose-water.

As well as for injections in ulcers in the vagina, occasioned from the corrosiveness of a long continuance of the whites, it is equally as efficacious for a gonorrhœa, particularly if any ulcers be in the urethra. This simple preparation sheathes the excoriated parts from the acrimony of the urine.

ESSENCE FOR THE HEAD-ACHE.

Take of French brandy, or rectified spirits of wine, one quart; put it into a strong bottle; and add one ounce of camphor cut small; a quarter of an ounce of essence of lemon; and two ounces of the strongest volatile spirit of sal ammoniac. Stop the bottle quite close, and shake it three or four times a-day for a week.

The method of using it is to rub the hand with a little of it, and hold it hard upon the part affected until it is dry; if the pain is not quite relieved, repeat it till it is.

COMPOUND TINCTURE OF SENNA, COMMONLY CALLED DAFFY'S ELIXIR.

Take of the best senna, two ounces; jalap, coriander seeds, and cream of tartar, of each one ounce; coarse sugar, three quarters of a pound; brandy, three pints: let them stand for ten or twelve days; then strain off what is fine for use.

This is an agreeable purge, and nothing can be more useful than to keep it ready made for family use.

GODFREY'S CORDIAL.

Take seven gallons of water, raspings of sassafras, and anise-seeds, of each four pounds; powder of carraway-seeds, eight ounces; opium, six ounces; coarse sugar, fifteen pounds; boil them together, till one half of the liquor be evaporated, then strain it through a coarse bag or cloth, and add three gallons of spirit of wine rectified.

STOUGHTON'S BITTERS.

Take gentian-root, two ounces; dried orange-peel, two ounces and an half; cochineal, in powder, half a drachm; proof spirit, or brandy, two pounds: let them stand ten or twelve days, and decant off what is clear for use.

FRIAR'S BALSAM, COMMONLY CALLED TURLINGTON'S BALSAM OF LIFE.

The true and best method of making it: Take gum Benjamin, twelve ounces; gum florax, eight ounces; balsam of Tolu (or Peru), four ounces; succotrine aloes, two ounces; rectified spirits of wine, five quarts and a pint; let them stand to digest twelve or fourteen days, then decant for use.

PILLS FOR GIDDINESS, PALSY, HEAD-ACHE, &c.

Take native cinnabar, levigated, two drachms; castor, and salt of amber, of each one drachm; oil of marjoram, fifteen drops; balsam of Peru, one drachm; syrup of piony, a sufficient quantity to make the mass; and form nine pills out of every drachm of it. The dose is three of them to be taken three times a-day.

PASTE FOR THE FISTULA, PILES, &c.

Take a pound of elecampane-root, three pounds of fennel-seeds, and one pound of black pepper; let these be made into a very fine powder, separately: take two pounds of honey, and the same quantity of sugar, in powder: melt the honey and sugar together over a gentle fire, scimming them continually, till they become as bright as amber: when they are cool, mix and knead them into your powders in the form of a paste.

The dose is the size of a nutmeg, morning, noon, and night. This has been found a specific for th fistula, piles, &c.

FOR THE WHOOPING COUGH, BY THE ROYAL COLLEGE OF PHYSICIANS.

Take flower of Benjamin, and strained opium, of each two drachms; camphor, two scruples: essential oil of anise-seed, half a drachm: rectified spirit of wine, one quart: digest, and strain off the elixir.

This is originally from Le Mort, and was published by Quincy, with four ounces of liquorice, and four of honey, which the college have omitted. It is anodyne and diaphoretic, and greatly contributes to allay tickling coughs, to open the breast, to give freedom of breathing, to cure an asthma, but particularly the whooping-cough in children. The dose for children is from five drops to twenty: and to grown persons, from twenty to one hundred, at night and morning, in Malaga wine.

DR. SMITH'S PRESCRIPTION FOR THE WHOOPING COUGH.

Take of the musk julep, six ounces; paregoric elixir, half an ounce: volatile tincture of valerian, one drachm: mix them, and take two spoonfuls three or four times every day.

Take milk of gum ammoniac, and small cinnamon-water, of each two ounces; tincture of castor, two drachms; syrup of balsam, half a drachm: mix them and administer one spoonful presently after.

Towards the decline of the disease, a decoction of the bark in full doses, may be prescribed to advantage.

APPENDIX

TO

CULPEPER'S BRITISH HERBAL.

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COMMON AMMOMUM.

Descript.—The lower leaves of this ammomum are long, and pinnated, or having small holes growing opposite to one another, on a common foot stalk, being about an inch long, and not above half the breadth, broader at the base, and ending sharper pointed, cut in on the edges, having a single leaf at the end of the foot-stalk. They are of a bright green colour. The stalk arises to the height of two or three feet, finely channeled and divided into several branches, on which grow the like leaves, but much less and finer; on the tops grow small umbels of white fine-leaved flowers, producing little striated seed, about the bigness of parsley seed, of a pleasant, hot, spicy, smell and taste, something like a nugmeg.

Place.—It grows in ditches, banks, and moist places, flowering in summer, its seed, which is the only part used, being ripe in August.

Virtues.—The seed is hot and dry, attenuating and good to open obstructions, to cleanse the reins of gravel, and sometimes given as carminatives and diuretics, like the other warm seeds, and usually substituted in the shops for those of the following.

THE TRUE AMMOMUM,

Has been formerly sold by the druggists under the name of Cardamomum majus, or the greater Cardamoms.

Descript.—It grows in bunches of roundish triangular capsulæ, containing several black cornered rough seed, like the lesser Cardamoms, of a hot aromatic taste. It can hardly be gathered, what the true ammomum of the ancients was, their descriptions thereof being so short and confused; but it is the opinion of the most learned and discerning authors, that the above-mentioned fruit answers best to the description of the ancients, and comes nearest to its virtues.

Virtues.—It is warming and comforting, strengthens the stomach, helps digestion, expels wind, and is good against the cholic and cold disorders of the stomach and bowels, as also against the biting of venomous creatures.

EPIMEDIUM; OR, BARRENWORT,

Is a shrub-like plant, shooting forth sundry, hard, round stalks, half a yard or two feet high, each stalk divided for the most part into three branches, and each of them bearing three leaves a-piece, which are severally, somewhat broad and round, yet pointed at the ends, hard or dry in feeling, and a little sharply dented about the edges, of a light green colour on the upper side, and whiter underneath; from the middle of some of the stalks or leaves, shooteth forth with them, from the first rising up of them, a small long footstalk of flowers, not much higher than the stalks of leaves, divided into branches, containing on each of them three flowers, separated into four parts, as if the flower consisted of but four leaves, whereas each part hath but two leaves, one lying close upon another, the inner being yellow and smaller than the lower, which are red, so that the red edge appeareth

round about the yellow, making it seem a yellow flower of four leaves, with red edges; it hath also a few yellow threads in the middle, set with green, the under side of the flowers being of a yellowish red colour, striped with white lines, which being past, small long pods appear, with flattish red seed in them, the roots are small and fibrous, hard and reddish, spreading much under ground, and delighteth best in shadowy, rather than sunny places; the scent of the plant is rather strong than pleasant.

Virtues.—We have not any late experience hereof to shew, but as Dioscorides, Pliny, and Galen have set down of it, that it is moderately cold and moist, without any special property more, than to keep women's breasts from growing too great, being made into a cataplasm, with oil, and applied; and that the report went, that the root would make women barren that took it inwardly, as also the leaves made in powder, and taken in wine for some time.

WHITE BEHEN.

This herb has a long, thick, whitish, woody, root, not much branched; from which spring several smooth weak stalks, about two feet high, with pretty large joints; at each of which grow two leaves opposite to one another without foot-stalks, two or three feet long, and about an inch broad, sharp-pointed at the end, of a glaucous or blueish green colour, smooth, and without any indentures about the edges. The flowers grow on the tops of long foot stalks, several together, of five small white leaves a-piece, standing in a loose swelled round husk or bladder, of a greenish white colour, with several fine darker veins; this encloses the roundish calyx, in which are contained small brown seed.

Place.—It is frequently to be met with in meadows and corn-fields, and flowers in July and August.

Virtues.—The roots are only used; and as to their qualities, they are accounted cordial, cephalic, alexi-

pharmic, and a provocative to venery. It is but seldom used.

BUCK-BEAN, OR MARSH TREFOIL.

Marsh trefoil has smooth round stalks three or four inches long, on which grow three longish round leaves, somewhat resembling the leaves of beans; among these arise stalks about two feet high, bare of leaves, and bearing on the top a spike of whitish purple flowers, of one leaf divided into five segments, whose inside is covered with a curled downiness, having five whitish chives in the middle, all set in five cornered calyces. The seed is small and brown, growing in roundish seed-vessels; the root is long and jointed, with many brownish fibres at each joint.

Place.—It grows in marshy, boggy grounds, and flowers in May and June. The leaves are used.

Virtues.—This is reckoned a great antiscorbutic, and very serviceable for the gout, rheumatism, and dropsy, and is much used in diet drinks for those distempers. It is likewise a good stomachic, made use of against intermitting fevers. It is likewise extolled against the scurvy. It is good in scorbutic consumption, in the itch, and other cutaneous diseases. It is good in gargles for the rottenness of the gums, and to fasten the teeth. It is given in powder, from a scruple to a drachm and upwards. In broth, water, or whey, a handful or two when decocted.

BUR REED.

Descript.—A common water plant, with leaves like flags and rough heads of seeds: it is two or three feet high. The stalks are round, green, thick, and upright. The leaves are very long and narrow, sharp at the edges, with a sharp ridge on the back along the middle; they are of a pale green, and look fresh and beautiful. The flowers are inconsiderable and yellowish: they stand in a kind of circular tufts

about the upper parts of the stalk: lower down stand the rough fruits called burs, from whence the plant obtained its name: they are of the bigness of a large nutmeg, green and rough. The root is composed of a quantity of white fibres.

Virtues.—The unripe fruit is used. They are astringent, and good against fluxes of the belly, and bleedings of all kinds; the best way of giving them is infused in a rough red wine, with a little cinnamon. They use them in some parts of England externally for wounds. A strong decoction of them is made to wash old ulcers, and the juice is applied to fresh hurts, and they say with great success.

CORN MARIGOLD.

Descript.—A very beautiful wild plant growing in corn-fields, with large blueish leaves, and full of flowers like marigolds. It is two feet high; the stalks are numerous, round, stiff, tolerably upright, and branched; the leaves stand irregularly, and are long, very broad, and of a blueish green; they are smallest towards the base, and larger at the end, and they are deeply cut in at the sides. The flowers are as broad as half a crown, and of a very beautiful yellow; they have a cluster of threads in the middle. The root is fibrous.

The flowers, fresh gathered and just opened, contain the greatest virtue. They are good against all obstructions, and work by urine. An infusion of them, given in the quantity of half a pint warm, three times a day, has been known to cure a jaundice, without any other medicine; the dried herb has the same virtue, but in a less degree.

COW-WHEAT.

Descript.—A common wild plant in our woods and thickets, with narrow leaves, and bright yellow flowers. It is eight or ten inches high. The stalks are square and slender; very brittle, weak, and sel-

dom quite upright. The leaves are oblong and narrow; sometimes of a dusky green colour, but oftener purplish or blackish; they are broadest at the base, and small all the way to the point; and they are commonly, but not always indented about the edges. The flowers stand, or rather hang, all on one side of the stalk, in a kind of loose spike; they are small and yellow, and grow two together. The seeds which follow these are large, and have something of the aspect of wheat, from whence the plant has its odd name.

Virtues.—These seeds are the part used; they are to be dried and given in powder, but in small doses. They have virtues, which few seem to imagine; they are a high cordial and provocative to venery; but if given in too large a dose, they occasion the head-ache and a strange giddiness. I knew an instance of a woman who had boiled the fresh tops of the plant in a large quantity in water, as a remedy for the jaundice, (I know not by what information,) and having drunk this in large draughts was as a person drunk and out of her senses; she complained of numbness in her limbs, and seemed in danger of her life, but nature recovered her after a few hours without other assistance.

LONG CYPERUS.

Descript.—A wild plant in our marshes, fens, and other damp places. It is a foot and a half high. The leaves are a foot long or more, narrow, grassy, and of a bright green colour, flat, and sharp at the ends. The stalk is triangular and green; there are no leaves on it, except two or three small ones at the top, from which there rises a number of small tufts or spikes of flowers. These are brown, light, chaffy, and in all respects like those of the other water grasses.

Virtues.—The root is used. It is long and brown, and when dried is of a pleasant smell, and aromatic

warm taste. It should be taken up in spring. It is good against pains in the head, and it promotes urine.

SWEET FLAG.

Descript.—A common wild plant that grows undistinguished among the flags and rushes by our ditch sides. The old physicians meant another thing by calamus aromaticus; they gave this name to the dried stalks of a plant, but at present it is used as the name of the root of this. The sweet flag grows three feet high, but consists only of leaves without a stalk. They are long, narrow, and of a pale green colour. Among these there are commonly three or four in all respects like the rest, but that they have a cluster of flowers breaking out on one side, within five or six inches from the top. This is long, brown, and thick, and resembles a catkin of a filbert tree, only it is longer and thicker. The root is long, flattish, and creeping: it is of a strong and rather unpleasant smell when fresh, but it becomes very fragrant, and aromatic in drying. Our own has its values, because we can have it fresh, but the dried root is better had of the druggists; they have it from warmer countries, where it is more fragrant.

Virtues.—The juice of the fresh root of acorus is excellent to promote the menses, it works by urine moderately, and gives no offence to the stomach. The dried root is cordial and sudorific, it warms the stomach, and is good against indigestions and fevers.

FOOL'S STONES.

Descript.—A beautiful wild plant in our meadows and pastures in June. The leaves are long and spotted, and the flowers are purple. It grows ten inches high. The leaves are six inches long, and three quarters of an inch broad, of a very deep green, with large and irregular blotches of black in different parts. The stalk is round, thick, upright, single, and fleshy;

it has two or three smaller leaves of the same figure, and at the top stands the flowers, in a spike of an inch and a half long; they are not very large, and of a shape different from the generality of flowers; their colour is a deep and glossy purple; but sometimes they are white. The whole plant is juicy. The root consists of two round bulbs or two round lumps, like a pair of testicles, and is white and full of a slimy juice.

Virtues.—The root is the only part used. It is supposed to be a strengthener of the parts of generation, and a promoter of venerial desires; but with what truth one cannot say. Externally applied in cataplasms, it is excellent in hard swellings. There are a great many other kinds of orchis in our meadows, but only this is used. The root, called salep by our druggists, is brought from Turkey, and is the root of a plant of this kind. It is strengthening and restorative, good in consumptions and all decays.

FROG BIT.

Descript.—A little plant, not uncommon on waters, with round leaves and small white flowers. It has been by the common writers called a kind of water lily, because its leaves are round, and it floats upon the water, but it is as distinct as any thing can be, when we regard the flower. Duck-weed has round leaves, and floats upon the water, and it might be called water lily for that reason, if that were sufficient. The leaves are of a roundish figure, and a dusky dark green colour; they are of the breadth of a crown piece, and they rise many together in tufts, from the same part of the stalk. This stalk runs along at a little distance under the surface of the water, and from it descends the roots, but they do not reach down into the mud, but play loose like the fibres of duckweed in the water. The flowers stand singly upon slender foot-stalks; they are white, and composed of three leaves a-piece, which give them a singular appearance.

Virtues.—The fresh leaves are used in outward applications, and are very cooling.

GOLD OF PLEASURE.

Descript.—A very pretty plant, common in many parts of England, and known at sight by the vast quantity of seed vessels. It is two feet high: the stalk is round, thick, firm, upright, and towards the top has a great many branches, all standing upright. The leaves stand irregularly, and are not numerous, they are long, not very broad, and of a pale green; they are indented about the edges, and surround the stalk at the base; the flowers are little and white; the seed vessels are short and roundish, and they stand in vast quantities, forming a kind of spikes all the way up the tops of the branches, with few flowers at the summit.

Virtues.—The fresh tops of the plant are to be used before it is run to seed. An infusion of them sweetened with honey, is excellent for sore throats, and ulcerations of the mouth. The seeds yield a great quantity of oil on pressing, and they are so plentiful, that it might seem worth while to cultivate the plant for them; the oil is pleasant and well tasted.

GLASSWORT.

Descript.—A common wild plant on the sea coasts of many parts of Europe. but not a native of our country. It is called cochleated kali, from the form of its seed-vessels, which are twisted in the manner of a snail's shell. It grows to a foot and a half in height. The stalk is round, thick, fleshy and brittle. The leaves are few, and they stand irregularly; they are oblong, and blunted at the ends, and of a blueish green colour. The flowers are small, inconsiderable, and yellow.

Virtues.—The juice of the fresh plant is said to be an excellent diuretic; but we have no opportunities of knowing its virtues here. Some say the seed-

vessels have the same virtue, and give them in infusion, but we have better remedies of the same kind, of our own growth. The whole plant is burnt for its fixed salt, which is used in making glass.

GOAT'S BEARD.

Descript.—A common wild plant, distinguished in our meadows by its narrow and green leaves, and the long leaves of the cup, about its yellow flowers. It grows to a foot and a half in height. The leaves are very narrow; they are broadest at the base, and smaller all the way to the point. The stalk is round, thick, firm, very upright, and towards the top divided into two or three branches. The flowers stand at the extremities of the stalks; they are of a beautiful pale yellow, very large and surrounded by a cup, composed of long and narrow green leaves, which, for the greatest part of the day, are closed over it, so that it seems only in bud. The seeds are winged with a fine white down, in the manner of those of dandelion, and when ripe, they stand upon the tops of the branches, in a round head, in the same manner. The root is long and white; and the whole plant is full of a milky juice, which, after it has been a little time exposed to the air, becomes yellow, and thick, like cream.

Virtues.—The root is used; it is so pleasant in taste, that it may be eaten in the manner of carrots, and other roots at table, but it exceeds them all in its qualities. It is an excellent restorative, and will do great service to people after long illnesses: the best way of giving it for this purpose, is to boil it first in water, and then cutting it to pieces, boil it again in milk, which is to be rendered palatable in the usual way; it becomes thus a most excellent medicine, in the form of food.

GROUND-PINE.

Descript.—A very singular little wild plant, of a

mossy appearance, and resinous smell: it grows four inches high; the stalks are hairy, and seldom stand upright; the leaves are very close set, and the young shoots which grow from their bosoms perfectly obscure the stalk; it seems a thick round tuft. These leaves are short, narrow, and divided into three parts at the ends, and they stand two at every joint of the stalk; they are rough and hairy like the stalk. The flowers are little and yellow, and they stand at the joints.

Virtues.—The whole plant is used, and it has great virtue; it is to be used dry in powder or infusion. It works strongly by urine, and promotes the menses. It opens also all obstructions of the liver and spleen, and is good in jaundice, the rheumatism, and most of the chronic disorders.

HARE'S FOOT.

Descript.—This plant seldom rises very high, but spreads out into many slender branches, having small narrow hairy trefoil leaves set at every joint; on the tops of the branches grow short round heads, composed of small papilionaceous pale purple flowers, each set in a soft woody calyx, making the heads appear soft and downy. The seed is small, lying at the bottom of the calyx; the root is little, and perishes yearly. It is found frequently among corn, and in fallow fields; and flowers in June and July. The whole plant is used, though not very often.

Virtues.—Hare's-foot is drying and binding; accounted good for a diarrhea and dysentery, and to stop the too great flux of the catamenia and the fluor albus. It helps the ulceration of the bladder, and heat and pain in making water.

GOOD HENRY, OR ENGLISH MERCURY.

Descript.—This mercury has a thick, yellowish, percunial root, with several fibres; the leaves grow upon long foot-stalks of a triangular shape, like spin-

nage, of a yellow green colour, feeling greasy or unctuous in handling. The stalks grow to be about a foot high, with several of the like leaves growing on them; and on their tops spikes of small herbaceous flowers inclosing little round black shining seed. It grows in waste places, among rubbish; and flowers sometime in the spring.

Virtues.—This herb is of a detersive cleansing quality. The young shoots, before they come to seed, boiled as spinnage or asparagus, are pleasant to the palate, cooling, soluble, and good for the scurvy, and provoke urine; outwardly it is much used in clysters, and a cataplasm of the leaves helps pains of the gout.

HONEYWORT.

Descript.—A juicy plant, frequently wild in many parts of Europe, but with us kept in gardens. It has its name from the sweet taste of the flowers. Almost all flowers have a drop of honey juice in their bottom: this is indeed the real substance of honey, for the bees only pick it out and get it together; the hollow flowers in general have more of it, or it is better preserved in them than others, but scarce any in so great a degree as this plant named from it. It is two feet high, when kept erect, but if left to itself, it is very apt to lean upon the ground. The stalk is round, thick, juicy, and tender; the leaves are large, oblong, broad, they surround and inclose the stalk at their base; they are of a blueish green colour, spotted or clouded irregularly with white, and they are full of a sort of prickles. The flowers grow at the top of the stalks, several together, among the clusters of leaves; they are hollow, oblong, and very wide open at the mouth, their colour is yellow, variegated with purple in the middle, and they have a very pretty appearance.

Virtues.—The fresh gathered tops of the plant are to be used; an infusion of them is cooling, and works

by urine. It is good against scorbutic complaints, and in the jaundice.

THE JACINTH, OR HYACINTH.

Descript.—The common spring plant our children gather with their cowslips and May flowers, and call blue bells. The root is white and roundish; the leaves are narrow and long, like grass, but of a deep green colour, and smooth surface; the stalks are round, upright, and smooth; they have no leaves on them. The flowers are large, and of a beautiful blue, they are hollow, oblong, and turn up at the rim. The root is the part used.

Virtues.—It abounds in a slimy juice, but it is to be dried, and this must be done carefully; the decoction of it operates well by urine; and the powder is balsamic, and somewhat styptic. It is not enough known. There is hardly a more powerful remedy for the whites.

FLEABANE.

Descript.—A pretty wild plant, frequent about damp places, with whitish leaves and large yellow flowers in autumn. It is two feet high. The stalk is round, and erect, very firm and strong, and is often of a reddish colour. The leaves are numerous, and stand irregularly; they are above an inch long, moderately broad, of a rough surface, and whitish green. The flowers stand at the top of the branches; they are broader than a shilling, yellow, and composed of many narrow petals. The whole plant has a disagreeable smell.

Virtues.—It is disputed whether this kind of fleabane, or another which is smaller, and has globous flowers, have the greater virtue; but mostgive it for this. The juice of the whole plant cures the itch, applied externally; and the very smell of the herb is said to destroy fleas.

BLACK HOREHOUND.

Descript.—A common wild plant of a disagreeable smell, thence also called by some stinking horehound The stalks are square, the leaves grow two at every joint, and are broad, short, and of a blackish green colour, but in shape not unlike those of the white kind. The flowers stand in clusters round the stalk at the joints as in the other, but they are red. The whole plant has a dismal aspect. The root is fibrous.

Virtues.—The plant is to be used fresh and dried, and it has more virtue than most imagine. It is to be given in the form of tea: it promotes the menses, and is superior to most things as a remedy in hysteric cases, faintings, convulsions, and low spiritedness, and all the train of those disorders.

MILKWORT.

Descript.—A common little plant upon our heaths, and in dry pastures, with numerous leaves and blue or white flowers, (for this is a variety and caused by accident) disposed in loose spikes. The root is long and divided into several parts, the stalks are very numerous, and very much branched, they are slender and weak, and they spread themselves upon the ground, forming a little green tuft. There is a great variety in the appearance of the plant, beside what has been already named in the colour of the flower; nor is that indeed the only variation there: so that it has been divided into two or three kinds by some writers, but as all these will rise from the same seed, and only are owing to the soil and exposure, the plant is without doubt the same in every appearance, and its virtues are the same in which ever state it is taken. When it grows in barren places, the stalks are not more than three or four inches in length, and the leaves are very numerous, short, and of an oval figure. The flowers are in this case small and blue, sometimes whitish, striated with blue. and sometimes en-

tirely white. When the plant grows in a somewhat more favourable soil, the leaves are oblong and narrow, pointed at the ends, and of a beautiful green, the stalks are five or six inches long, and the flowers in this case are commonly blue, and this is the most ordinary state of the plant. When it grows in very favourable places, as upon the damp side of a hill, where there are springs, and among the tall grass, then its leaves are longer, its stalks more robust and more upright, and its flowers are red. These are the several appearances of this little plant, and it is all one in which of them it is taken. The root is often of a considerable thickness, and single, but it is more usually divided and smaller; it is whitish, and of a disagreeable acrid taste.

Virtues.—This plant had passed unregarded as to any medicinal use, till Dr. Tennent brought into England the senekka root, famous in America against the effects of the bite of a rattle-snake, and found here to be of service in pleurisies: but when it was found, that this was the root of a kind of milkwort, not very different from our own, we tried the roots of our own kind, and found them effectual in the same cases: as to the poisonous bites of a serpent, they are so uncommon here, that we need not regard that part of the qualities, but we find it good in the other disorders, and in all diseases in which the blood is thick and sizy. The fresh root is best, but it has not its full virtue except in spring, when the stalks are just shooting out of the ground, for this reason it is most proper to take it up at that time, and dry it for the service of the year. When fresh it is best given in infusion: but when dried it is kept in powder.

WATER MINT.

Descript.—A common wild plant of the mint kind, not so much regarded as it deserves. It is frequent by ditch sides. It is a foot and a half high. The

stalks are square, upright, firm, and strong, and generally of a brown colour; the leaves are broad and short; they stand two at a joint, and are of a brownish or deep green colour, somewhat hairy, and serrated about the edges. The flowers are larger than those of common mint, and are of a pale red colour; they stand in round thick clusters at the tops of the stalks, and round the upper joints. The whole plant has a strong smell, not disagreeable, but of a mixed kind between that of mint and pennyroyal: and the taste is strong and acrid, but it is not to be called disagreeable.

Virtues.—A distilled water of this plant is excellent against cholics, pains in the stomach and bowels, and it will bring down the menses. A single dose of it often cures the cholic. The use of peppermint has excluded this kind from the present practice, but all three ought to be used. Where a simple weakness of the stomach is the complaint, the common mint should be used; when cholicy pains alone, the peppermint, and where suppression of the menses are in the case, this wild water-mint; they may all be given in the way of tea, but a simple water distilled from them, and made sufficiently strong, is by much the most efficatious.

MILK THISTLE.

Descript.—A very beautiful plant, common by road-sides, but wanting only to have been a native of Greece, or the Indies, to be esteemed one of the most elegant vegetables in the world. The leaves rising from the root are two feet long, and more than a foot broad, of a beautiful deep green, variegated all over with irregular lines of a milk white, dentated deeply at the edges, and prickly. They spread themselves into a round of more than a yard diameter, and when they grow out of the way of dust, make a most charming appearance. A single stalk rises in the midst of these. It is five feet high, round, thick,

very firm, upright, and divided at the top into a few branches. The leaves on it are like those from the root, and variegated with white in the same manner. At the tops stand the flowers, which are of the nature of those of other thistles, but twice as big, and vastly more beautiful. The flowery part is of a deep and fine purple; the head itself is composed of beautiful scales arranged with great regularity, and each terminating in a single and very strong prickle; the root is long and thick; the seeds are winged with down.

Virtues.—The root and seeds are used. An infusion of the fresh root removes obstructions, and works by urine: it is good against the jaundice. The seeds beaten up into an emulsion with barley-water are good in pleurisies. The young leaves with the prickles cut off, are excellent boiled in the way of cabbage; they are very wholesome, and exceed all other greens in taste.

OXEYE.

Descript.—A very beautiful wild plant, common in the North of England, but not in other parts of the kingdom. It grows a foot and a half high. The stalk is round, firm, and branched; the leaves are numerous; they are divided each into a multitude of fine segments, so that at a distance they somewhat resemble the leaves of yarrow, but they are whitish. The flowers are large and yellow; they somewhat resemble a marigold in form, and they stand at the tops of the branches.

Virtues.—The fresh herb is used; they boil it in ale, and give it as a remedy for the jaundice: it works by urine.

INDIAN SPIKENARD.

Descript.—An East Indian plant, of the grass kind, with triangular stalks, and yellowish flowers. It resembles not a little that common yellow tufted

grass, which is frequent in our meadows in spring. It is six or eight inches high. The leaves are long, narrow, and of a pale green; they are very numerous, and stand in a thick tuft, almost growing together at the bases. The stalks rise among these; they are naked, triangular, and of a pale green colour; the flowers stand in tufts, of the bigness of an horse-bean, on the tops of the stalks; they are blackish, but ornamented with yellow threads, which give the whole a yellowish appearance. This is the plant, some samples of which have been of late brought over as the Indian spikenard, and there is reason and authority for supposing they are so. The tops of the roots have that sort of tuft of hairy matter, which we call Indian spikenard, growing to them; and it is of the nature of the hairy top of the spignel root, owing to the fibres of decayed leaves. Breynius also calls the plant which affords the Indian spikenard, a kind of cyperus grass.

Virtues.—The tufts of fibres at the tops of the root of this plant, is what we call Indian spikenard; they are brown, flattish, matted together, and of a pleasant smell: they are good in disorders of the nerves, and hysteric cases; but so many better medicines are at hand, that it is rarely used.

SNEEZEWORT, WITH SERRATED LEAVES.

Descript.—From a woody, creeping, fibrous root, of a hot biting taste, this plant sends out upright stalks, a foot or more high, stiff, and not much branched, having long narrow leaves, finely serrated about the edges, growing on them without any order; the flowers grow umbel fashion on the tops of the stalks, consisting of a border of white petela, set about a fistular thrum; they are larger than the flowers of the yarrow.

Place.—It grows in moist meadows and watery places, and flowers in July.

Virtues.—It is of a hot biting taste; and therefore

it is sometimes put into salads to correct the coldness of other herbs. The roots held in the mouth helps the tooth ache, by evacuating the rheum, like pellitory of Spain; the powder of the herb snuffed up the nose, causes sneezing, and cleanses the head of tough slimy humours.

SPEEDWELL.

Descript.—A common little plant in our dry pastures, aud on heaths. The stalks are six or eight inches long; the leaves are short, and of an oval figure. The stalks are not upright: they trail along the ground, only rising at their upper parts. The leaves are of a pale green colour, a little hairy and dentated at the edges: the flowers are small and blue; they grow in slender spikes, arising from the bosoms of the leaves; the root is small and fibrous.

Virtues.—The whole herb is used, and it is best fresh. An infusion of it drank in quantities, works by urine, and opens all obstructions: it promotes the menses. There was an opinion lately that this plant would cure the gout. The dried leaves picked from the stalks, were sold in our markets, and people made a tea of them. The opinion was so prevalent, that the plant was in a manner destroyed for many miles about London, but like all other things that want truth for their foundatian, it came to nothing.

WHITLOW-GRASS.

Descript.—A common little plant, early in spring, on our walls and houses, and of a very singular aspect; it is red, and has pretty white flowers. It is not more than four inches high; the stalks are round, upright, and a little hairy; and they are covered with an unctuous clamminess, which makes them stick to the fingers in handling. The leaves are little, and also red; they are each divided into three parts at the extremity, in the way of fingers: they stand irregularly on the stalks, and they are thick

fleshy, and clammy in handling. The flowers stand at the tops of the branches; they are little, but of a very bright white, and look very conspicuous. The whole plant dies away as soon as it has ripened the seed, and is not to be seen again till the next spring.

Virtues.—The fresh gathered plant is to be used entire: a strong infusion of it is a very great sweetener of the blood. It is excellent against the scurvy in whatever form; and there are accounts of its curing the king's evil, that seem very well attested. A syrup may be made of its juice, or of a very strong infusion of it; or a conserve of the leaves: for the dried plant has very little virtue, and it is to be had fresh only a very small part of the year.

WATER ARROW HEAD.

Descript.—A very pretty plant, common in our ditches, with leaves like the bearded heads of arrows, and with pretty white flowers. It is two feet and a half high, but generally the greatest part of the stalk is buried in water, very little appearing above, except the spike of flowers. The leaves stand each upon a pedicle, which is round, thick, and very long; they are of a beautiful green, and are broad, and bearded at the base, and sharp at the point; the flowers are white, tolerably large, and very bright; and the stalk, on which they are supported, is also round and thick.

Virtues.—The common people in many places have a custom of applying these leaves bruised to inflammations; they cool and give ease, but it is not always right.

WATER PLANTAIN.

Descript.—A very common tall plant in ditches, and having not the least resemblance of any kind of plantain, except in the leaves; from which however it has received its name. The root is composed of a great quantity of fibres. From this there rise in

spring a number of leaves, oblong, broad, smooth, and of a beautiful green colour, and having in shape, though not at all in colour or consistence, some slight resemblance to plantain: they are perfectly smooth, of a glossy surface, and brittle. These stand for many months without the stalk; and doubtless in this state it got the name. The stalk is two feet or more in height; round, firm, and upright; and at the top it sends out a vast number of branches, which send out others smaller; and even these last are again divided. On the tops of the last division stand the flowers with their buds, and the seed-vessels; so that the whole has the appearance of a cone. The flowers are little and white, and consist of three leaves each; they stand but a little time, and only a few are seen together.

Virtues.—The seed is the part used; the plant is to be suffered to stand, till this is thoroughly ripe, and then cut up gently, and laid to dry two or three days upon a table: a smart stroke or two, will dislodge a great quantity of the seeds; they are very good against the overflowing of the menses, and all other bleedings; and are given in powders, in electuaries, small doses being to be taken at a time, and often repeated.

WOODRUFFE.

Descript.—A common little wild plant in our woods and thickets; it is ten inches high. The stalk is square, slender, weak, and not able to support itself perfectly upright. The leaves stand several at each joint, encompassing the stalk in the manner of a star; they are oblong, broad, and of a deep green. In their form and manner of growth they much resemble common cleavers, but they are larger, though the plant is so much less, and they are not rough as in that plant, but nearly smooth. The flowers stand at the tops of the stalks in little clusters; they are small and white; the seeds stand two together in a globular form. The roots are little and fibrous.

Virtues.—The fresh herb is used, and is best given in a strong decoction; it opens obstructions of the liver and spleen, and is a cordial and stomachic. It is good in the jaundice.

SEA WORMWOOD.

Descript.—A plant common in our salt marshes, and about ditches, where salt-water comes. It has somewhat the aspect of wormwood, but the leaves are much narrower in the divisions, and the whole plant is smaller. The stalks are woody, firm, upright, very much branched, and a foot and a half high. The leaves are whitish and small. The flowers stand in loose spikes at the top of the stalks; they are little and brown; and they very much resemble those of the common wormwood, except for the size. The whole plant has a bitter taste, but not disagreeable, and it has a pleasant aromatic smell.

Virtues.—The tops fresh gathered, and the whole plant dry, are used. They call it Roman wormwood at the markets and in the shops; and it is used for the other; it has the same general virtues. All the three kinds indeed possess them in common; but the common wormwood is the most disagreeable to the taste, and sits worst upon the stomach: this is better than that, but it is much more disagreeable than the true Roman wormwood. It is very strengthening to the stomach; it assists digestion, and prevents wind. It is commonly an ingredient in the bitter infusions, and tinctures of the shops, but it does very well alone; boiling water poured upon it, and suffered to stand till it is cold, then strained off, is an excellent medicine to cause an appetite. Put into white wine, it also gives a pleasant bitter flavour with the same virtues.

DIRECTIONS

FOR

MAKING SYRUPS, &c.

—000—

HAVING in divers places of this Treatise promised you the way of making Syrups, Conserves, Oils, Ointments, &c. of herbs, roots, flowers, &c. whereby you may have them ready for your use at such times when they cannot be had otherwise; I come now to perform what I promised, and you shall find me rather better than worse than my word.

That this may be done methodically, I shall divide my directions into two grand sections, and each section into several chapters, and then you shall see it look with such a countenance as this is.

SECTION I.

OF GATHERING, DRYING, AND KEEPING SIMPLES, AND THEIR JUICES.

CHAP. I. Of leaves of herbs, &c.
—— II. Of Flowers.
—— III. Of Seeds.
CHAP. IV. Of Roots.
—— V. Of Barks.
—— VI. Of Juices.

SECTION II.

OF MAKING AND KEEPING COMPOUNDS.

CHAP. I. Of distilled Waters.
—— II. Of Syrups.
—— III. Of Juleps.
—— IV. Of Decoctions.
—— V. Of oils.
—— VI. Of Electuaries.
—— VII. Of Conserves
—— VIII. Of Preserves
CHAP. IX. Of Lohocks
—— X. Of Ointments
—— XI. Of Plaisters
—— XII. Of Poultices
—— XIII. Of troches.
—— XIV. Of Pills.
—— XV. The way of fitting Medicines to compound diseases.
Of all these in order.

CHAP. I

Of leaves of Herbs, or Trees.

1. Of leaves choose only such as are green and full of juice; pick them carefully, and cast away such as are declining, for they will putrify all the rest. So shall one handful be worth ten of those you buy in Cheapside.

2. Note what places they most delight to grow in, and gather them there; for betony that grows in the shade is far better than that growing in the sun, because it delights in the shade; so also such herbs as delight to grow near the water, shall be gathered near it, though haply you may find some of them upon dry ground. The treatise will inform you where every herb delights to grow.

3. The leaves of such herbs as run up to seed are not so good when they are in flower as before, (some few excepted, the leaves of which are seldom or never used) in such cases, if through ignorance they were not known, or through negligence forgotten, you had better take the top and the flowers than the leaf.

4. Dry them well in the sun, and not in the shade, as the saying of the physician is; for if the sun draw away the virtues of the herb, it must needs do the like by hay, by the same rule, which the experience of every country farmer will explode for a notable piece of nonsense.

5. Such as are astrologers (and indeed none else are fit to make physicians) such I advise; let the planet that governs the herb be angular, and the stronger the better; if they can, in herbs of Saturn, let Saturn be in the ascendant; in the herb of Mars, let Mars be in the Mid-heaven, for in those houses they delight; let the Moon apply to them by good aspect, and let her not be in the houses of her enemies; if you cannot well stay till she apply to them, let her apply to a planet of the same triplicity; if you cannot wait that time neither, let her be with a fixed star of their nature.

6. Having well dried them, put them up in brown paper, sewing the paper up like a sack, and press them not too hard together, and keep them in a dry place near the fire.

7. As for the duration of dried herbs, a just time cannot be given, let authors prate at their pleasure; for,

1st. Such as grow upon dry grounds will keep better than such as grow on moist.

2dly. Such herbs as are full of juice will not keep so long as such as are dryer.

3dly. Such herbs as are well dried, will keep longer than such as are slack dried. Yet you may know when they are corrupted by their loss of colour, or smell, or both: and, if they be corrupted, reason will tell you that they must needs corrupt the bodies of those people that take them.

8. Gather all leaves in the hour of that planet that governs them,

CHAP. II.

Of Flowers.

The flower, which is the beauty of the plant, and of none of the least use in physic, groweth yearly, and is to be gathered when it is in its prime.

2. As for the time of gathering them, let the planetary hour, and the plant they come off be observed, as we shewed you in the foregoing chapter: as for the time of the day, let it be when the sun shines upon them, that so they may be dry: for if you gather either flowers or herbs when they are wet or dewy, they will not keep.

3. Dry them well in the sun, and keep them in papers near the fire, as I shewed you in the foregoing chapter.

4. So long as they retain the smell and colour, they are good; either of them being gone, so is their virtue also.

CHAP. III.

Of Seeds.

1. The seed is that part of the plant which is endowed with a vital faculty to bring forth its like, and it contains potentially the whole plant in it.

2. As for the place, let them be gathered from the place where they most delight to grow.

3. Let them be full ripe when they are gathered, and forget not the celestial harmony before mentioned; for I have found by experience that their virtues are twice as great at such times as others: "There is an appointed time for every thing under the sun."

4. When you have gathered them, dry them a little, and but a very little, in the sun before you lay them up.

5. You need not be so careful of keeping them so near the fire as the other before mentioned, because

they are fuller of spirit, and therefore not so subject to corrupt.

6 As for the time of their duration, it is palpable they will keep a good many years; yet they are best the first year, and this I make appear by a good argument. They will grow soonest the first year they be set, therefore then they are in their prime; and it is an easy matter to renew them yearly.

CHAP. IV.

Of Roots.

1. Of roots choose neither such as are rotten or worm-eaten, but proper in their taste, colour, and smell, such as exceed neither in softness nor hardness.

Give me leave to be a little critical against the vulgar received opinion, which is, that the sap falls down into the root in the autumn, and rises in the spring, as men go to bed at night and rise in the morning; and this idle talk of untruth is so grounded in the heads, not only of the vulgar but also of the learned, that a man cannot drive it out by reason. I pray, let such sap-mongers answer me this argument: If the sap falls into the roots in the fall of the leaf, and lies there all the winter, then must the root grow only in the winter. But the root grows not at all in winter, as experience teacheth, but only in summer; therefore if you set an apple kernel in the spring, you shall find the root grow to a pretty bigness in the summer, and be not a whit bigger next spring. What doth the sap do in the root all that while? Prick straws? 'Tis as rotten as a post.

The truth is, when the sun declines from the tropic of Cancer, the sap begins to congeal both in root and branch: when he touches the tropic of Capricorn, and ascends to us-ward, it begins to wax thin again, and by degrees, as it congealed. But to proceed.

3. The drier time you gather the roots in, the better they are, for they have the less excrementitous moisture in them.

4. Such roots as are soft, your best way is to dry in the sun, or else hang them in the chimney corner upon a string; as for such as are hard, you may dry them anywhere

5. Such roots as are great, will keep longer than such as are small; yet most of them will keep all the year.

6. Such roots as are soft, it is your best way to keep them always near the fire, and take this general rule for it. If in winter time you find any of your herbs, roots, or flowers begin to be moist, as many times you shall (for it is your best way to look to them once a month) dry them by a very gentle fire, or, if you can, with conveniency, keep them near the fire, you may save yourself the trouble.

7. It is in vain to dry roots that may commonly be had, as parsley, fennel, plantain, &c. but gather them only for present need.

CHAP. V.

Of Barks.

1. Barks, which physicians use in medicine, are of these sorts: of fruits, of roots, of boughs.

2. The barks of fruits are to be taken when the fruit is full ripe, as oranges, lemons, &c. but because I have nothing to do with exotics here, I pass them without any more words.

3. The bark of trees are best gathered in the spring, if of oak or such great trees; because then they come easier off, and so you may dry them if you please; but indeed the best way is to gather all barks only for present use.

4. As for the bark of roots, 'tis thus to be gotten: Take the roots of such herbs as have a pith in them, as parsley, fennel, &c. slit them in the middle, and when you have taken out the pith, which you may easily do, that which remains is called, though improperly, the bark, and indeed is only to be used.

CHAP. VI.

Of Juices.

1. Juices are to be pressed out of herbs when they are young and tender, out of some stalks, and tender tops of herbs and plants, and also out of some flowers.

2. Having gathered the herb, if you would preserve the juice of it when it is very dry (for otherwise the juice will not be worth a button) bruise it well in a stone mortar with a wooden pestle, then having put it into a canvass bag, the herb I mean, not the mortar, for that will give but little juice, press it hard in a press, then take the juice and clarify it.

3. The manner of clarifying it is this: Put it into a pipkin or skillet, or some such thing, and set it over the fire; and when the scum ariseth take it off; let it stand over the fire till no more scum arise; when you have your juice clarified, cast away the scum as a thing of no use.

4. When you have thus clarified it, you have two ways to preserve it all the year.

1st. When it is cold put it into a glass, and put so much oil on it as will cover it to the thickness of two fingers; the oil will swim at the top, and so keep the air from coming to putrify it. When you intend to use it, pour it into a porringer, and if any oil come out with it, you may easily scim it off with a spoon, and put the juice you use not into the glass again, it will quickly sink under the oil.

2nd. The second way is a little more difficult, and the juice of fruits is usually preserved this way. When you have clarified it, boil it over the fire, till being cold it be of the thickness of honey. This is most commonly used for diseases of the mouth, and is called roba and saba.

And thus much for the first section, the second follows.

SECTION II.

THE WAY OF MAKING AND KEEPING ALL NECESSARY COMPOUNDS.

CHAP. I.

Of Distilled Waters.

HITHERTO we have spoken of medicines which consist in their own nature, which authors vulgarly call Simples, though something improperly; for in truth, nothing is simple but pure elements; all things else are compounded of them. We come now to treat of the artificial medicines, in the form of which, because we must begin somewhere, we shall place distilled waters; in which consider,

1. Waters are distilled of herbs, of flowers, of fruits, and of roots.

2. We speak not of strong waters, but of cold, as being to act Galen's part, and not Paracelsus's.

3. The herbs ought to be distilled when they are in the greatest vigour, and so ought the flowers also.

4. The vulgar way of distillations which people use because they know no better, is in a pewter still; and although distilled waters are the weakest of artificial medicines, and good for little but mixtures of other medicines, yet they are weaker by many degrees than they would be were they distilled in sand. If I thought it not impossible to teach you the way of distilling in sand, I would attempt it.

5. When you have distilled your water, put it into a glass covered over with a paper pricked full of holes, so that the excrementitious and fiery vapours may exhale, which cause that settling in distilled waters called the mother, which corrupt them, then cover it close and keep it for your use.

6. Stopping distilled waters with a cork makes them musty, and so does paper if it but touch the water; it is best to stop them with a bladder, being first put in water, and bound over the top of the glass.

Such cold waters as are distilled in a pewter still (if well kept) will endure a year; such as are distilled in sand, as they are twice as strong, so they endure twice as long.

CHAP. II.

Of Syrups.

1. A Syrup is a medicine of a liquid form, composed of infusion, decoction, and juice. And

1st. For the more graceful taste.

2dly. For the better keeping of it; with a certain quantity of honey or sugar hereafter mentioned, boiled to the thickness of new honey.

2. You see at the first view that this aphorism divides itself into three branches, which deserves severally to be treated of, viz.

1. Syrups made by infusion.
2. Syrups made by decoction.
3. Syrups made by juice.

Of each of these, for your instruction's sake, kind countrymen and women, I speak a word or two apart.

1st. Syrups made by infusion are usually made of flowers, and of such flowers as soon loose their colour and strength by boiling, as roses, violets, peach-flowers, &c. My translation of the London Dispensatory will instruct you in the rest. They are thus made; Having picked your flowers clean, to every pound of them, add three pounds, or three pints, which you will, for it is all one, of spring water, made boiling hot; but first put your flowers into a pewter pot with a cover, and pour the water on them; then shutting the pot let it stand by the fire to keep hot twelve hours, and strain it out; (in such syrups as purge, as damask roses, peach-flowers, &c. the usual, and indeed the best way,

is to repeat this infusion, adding fresh flowers to the same liquor divers times, so that it may be stronger) having strained it out, put the infusion into a pewter bason, or an earthren one well glazed, and to every pint of it add two pounds of sugar, which being only melted over the fire without being boiled, and then scimmed, will produce you the syrup you desire.

2dly. Syrups made by decoction are usually made of compounds, yet may any simple herb be thus converted into syrup. Take the herb, roots, or flowers you would make into a syrup, and bruise a little; then boil it in a convenient quantity of spring water; the more water you boil it in the weaker it will be; a handful of the herb or root is a convenient quantity for a pint of water; boil it till half the water be consumed, then let it stand till it be almost cold, and strain it through a woollen cloth, letting it run out at leisure, without pressing. To every pint of this decoction add one pound of sugar, and boil it over the fire till it comes to a syrup, which you may know if you now and then cool a little of it with a spoon; scim it all the while it boils, and when it is sufficiently boiled, whilst it is hot strain it again through a piece of woollen cloth, but press it not. Thus you have the syrup perfected.

3dly. Syrups made of juice are usually made of such herbs as are full of juice, and indeed they are better made into a syrup this way than any other; the operation is thus: having beaten the herb in a stone mortar with a wooden pestle, press out the juice and clarify it, as you are taugh in the juices; then let the juice boil away till about a quarter of it be consumed; to a pint of this add a pound of sugar, and boil it to a syrup, always scimming it, and when it is boiled enough, strain it through a woollen cloth, as we taught you before, and keep it for your use.

3. If you make a syrup of roots, that are anything hard, as parsley, fennel, and grass roots, &c. when you

have bruised them, lay them to steep in that water that you intend to boil them, hot, so will the virtues the better come out.

4. Keep your syrups either in glasses or stone pots, and stop them not with cork or bladder, unless you would have the glass break and the syrup lost, only bind paper about the mouth.

All syrups, if well made, will continue a year with some advantage; yet such as are made by infusion keep shortest.

CHAP. III.

Of Juleps.

1. Juleps were first invented, as I suppose, in Arabia; and my reason is, because the word julep is an Arabic word.

2. It signifies only a pleasant potion, as is vulgarly used by such as are sick and want help, or such as are in health, and want no money to quench their thirst.

3. Now-a-day it is commonly used,

1. To prepare the body for purgation.
2. To open obstructions and the pores.
3. To digest tough humours.
4. To qualify hot distempers, &c.

4. Simples, juleps, (for I have nothing to say to compounds here) are thus made: Take a pint of such distilled water as conduces to the cure of your distemper, which this treatise will plentifully furnish you with, to which add two ounces of syrup conducing to the same effect; (I shall give you rules for it in the next chapter) mix them together and drink a draught of it at your pleasure. If you love tart things, add ten drops of oil of vitrol to your pint, and shake it together, and it will have a fine grateful taste.

5. All juleps are made for present use, and therefore it is in vain to speak of their duration.

CHAP. IV.

Of Decoctions.

1. All the difference between decoctions, and syrups made by decoction, is this; syrups are made to keep, decoctions only for present use; for you can hardly keep a decoction a week at any time; if the weather be hot, you cannot keep it half so long.

2. Decoctions are made of leaves, roots, flowers, seeds, fruit, or barks, conducing to the cure of the disease you make them for, and are made in the same manner as we shewed you in syrups.

3. Decoctions made with wine last longer than such as are made with water; and if you take your decoction to cleanse the passage of the urine or open obstructions, your best way is to make it with white wine instead of water, because this is penetrating.

4. Decoctions are of most use in such diseases as lie in the passage of the body, as the stomach, bowels, kidnies, passages of urine and bladder, because decoctions pass quicker to those places than any other form of medicine.

5. If you will sweeten your decoction with sugar, or any syrup fit for the occasion you take it for, which is better, you may, and no harm.

6. If in a decoction you boil both roots, herbs, flowers and seed together, let the roots boil a good while first, because they retain their virtues longest; then the next in order by the same rule, viz. 1. the barks, 2. the herbs. 3. the seeds. 4. the flowers. 5. the spices, if you put any in, because then the virtues come soonest out.

7. Such things as by boiling cause sliminess to a decoction, as figs, quince-seed, linseed, &c. your best way is, after you have bruised them, to tie them up in a linen rag, as you tie up calf's brains, and so boil them.

8. Keep all decoctions in a glass close stopped, and

the cooler place you keep them in the longer they will last ere they be sour.

Lastly. The usual dose to be given at one time is two, three, four, or five ounces, according to the age and strength of the patient, the season of the year, the strength of the medicine, and the quality of the disease.

CHAP. V.

Of Oils.

1. Oil Olive, which is commonly known by the name of salad oil, I suppose, because it is usually eaten with salads by them that love it; if it be pressed out of ripe olives, according to Galen, is temperate, and exceeds in no one quality.

2. Of oils, some are simple, and some are compound.

3. Simple oils are such as are made of fruits or seeds by expression, as oil of sweet or bitter almonds, linseed and rape seed oil, &c. of which see in my dispensatory.

4. Compound oils are made of oil of olives, and other simples, imagine herbs, flowers, roots, &c.

5. The way of making them is this: having bruised the herbs or flowers you make your oil of, put them into an earthen pot, and to two or three handsful of them pour a pint of oil, cover the pot with a paper, set it in the sun about a fortnight or so, according as the sun is in hotness: then having warmed it very well by the fire, press out the herb, &c. very hard in a press, and add as many more herbs to the same oil; bruise the herbs (I mean not the oil) in like manner, set them in the sun as before; the oftener you repeat this, the stronger your oil will be; at last, when you conceive it strong enough, boil both oil and herbs together, till the juice be consumed, which you may know by its leaving its bubbling, and the herbs will be crisp; then strain it while it is hot, and keep it in a stone or glass vessel for your use.

6. As for chemical oils, I have nothing to say here.

7. The general use of these oils is for pains in the limbs, roughness in the skin, the itch, &c. as also for ointments and plaisters.

8. If you have occasion to use it for wounds or ulcers, in two ounces of oil, dissolve half an ounce of turpentine, the heat of the fire will quickly do it; for oil itself is offensive to wounds, and the turpentine qualifies it.

CHAP. VI.

Of Electuaries.

Physicians make more a quoil than needs by half about electuaries. I shall describe but one general way of making them up: as for ingredients you may vary them as you please, and as you find occasion, by the last chapter.

1. That you may make electuaries when you need them, it is requisite that you keep always herbs, roots, flowers, seeds, &c. ready dried in your house, that so you may be in readiness to beat them into a powder when you do need them.

2. It is better to keep them whole than beaten; for being beaten, they are more subject to lose their strength, because the air soon penetrates them.

3. If they be not dry enough to beat into powder when you need them, dry them by a gentle fire till they are so.

4. Having beaten them, sift them through a fine tiffany searce, that no great pieces may be found in your electuary.

5. To one ounce of your powder add three ounces of clarified honey; this quantity I hold to be sufficient. If you would make more or less electuary, vary your proportion accordingly.

6. Mix them well together in a mortar, and take this for a truth, you cannot mix them too much.

7. The way to clarify honey, is to set it over the

fire in a convenient vessel till the scum arise, and when the scum is taken off it is clarified.

8. The usual dose of cordial electuaries is from half a drachm to two drachms; of purging electuaries, from half an ounce to an ounce.

9. The manner of keeping them is in a pot.

10. The time of taking them is either in a morning fasting, and fasting an hour after them; or at night going to bed, three or four hours after supper.

CHAP. VII.

Of Conserves.

The way of making conserves is two-fold; one of herbs and flowers, and the other of fruits.

2. Conserves of herbs and flowers are thus made, if you thus make your conserve of herbs, as of scurvy grass, wormwood, rue, and the like, take only the leaves, and the tender tops (for you may beat your heart out before you can beat the stalks small) and having beaten them, weigh them, and to every pound of them add three pounds of sugar; you cannot beat them too much.

3. Conserves of fruits, as barberries, sloes, and the like, are thus made: first scald the fruit, then rub the pulp through a thick hair sieve made for that purpose, called a pulping sieve: you may do it for a need with the back of a spoon, then take this pulp thus drawn and add to it its weight of sugar, and no more; put it into a pewter vessel and over a charcoal fire: stir it up and down till the sugar be melted, and your conserve is made.

4. Thus you have the way of making conserves; the way of keeping them is in earthern pots.

5. The dose is usually the quantity of a nutmeg at a time, morning and evening, or (unless they are purging) when you please.

6. Of conserves, some keep many years, as conserve

of roses; others but a year, as conserve of borage, bugloss, cowslips, and the like.

7. Have a care of the working of some conserves presently after they are made; look to them once a day, and stir them about. Conserves of borage, bugloss, and wormwood, have an excellent faculty at that sport.

7. You may know when your conserves are almost spoiled by this; you shall find a hard crust at the top with little holes in it as though worms had been eating there.

CHAP. VIII.

Of Preserves.

Of preserves are sundry sorts, and the operation of all being somewhat different, we shall handle them all apart. These are preserved with sugar.

1. Flowers.
2. Fruits.
3. Roots.
4. Barks.

1. Flowers are very seldom preserved; I never saw any that I remember save only cowslip flowers, and that was a great fashion in Sussex when I was a boy. It is thus done. Take a flat glass, we call them jar-glasses, strew on a laying of fine sugar, on that a laying of flowers, and on that another laying of sugar, on that another laying of flowers, so do till your glass be full; then tie it over with a paper, and in a little time you shall have very excellent and pleasant preserves.

There is another way of preserving flowers, namely with vinegar and salt, as they pickle capers and broom buds; but as I have little skill in it myself, I cannot teach you.

2. Fruits, as quinces and the like, are preserved two different ways.

1st. Boil them well in water, and then pulp them

6. It is kept in pots, and may be kept a year and longer.

7. It is excellent for roughness of the wind-pipe, inflammations and ulcers of the lungs, difficulty of breathing, asthmas, coughs, and distillations of humours.

CHAP. X.

Of Ointments.

1. Various are the ways of making ointments, which authors have left to posterity, and which I shall omit, and quote one which is easiest to be made, and therefore most beneficial to people that are ignorant in physic, for whose sake I write this. It is thus done:

Bruise those herbs, flowers, or roots, you will make an ointment of, and to two handsful of your bruised herbs add a pound of hog's grease dried, or cleansed from the skins, beat them very well together in a stone mortar with a wooden pestle, then put it into a stone pot, (the herb and grease I mean, not the mortar) cover it with a paper, and set it either in the sun or some other warm place, three, four, or five days, that it may melt; then take it out and boil it a little, and whilst it is hot strain it out, pressing it out very hard in a press; to this grease add as many more herbs as before, let them stand in like manner as long, then boil them as you did the former. If you think your ointment not strong enough, you may do it the third and fourth time; yet this I will tell you, the fuller of juice the herbs are, the sooner will your ointment be strong: the last time you boil it, boil it so long till your herbs be crisp, and the juice consumed, then strain it, pressing it hard in a press, and to every pound of ointment add two ounces of turpentine and as much wax, because grease is offensive to wounds as well as oil.

2. Ointments are vulgarly known to be kept in pots, and will last above a year, sometimes above two years.

CHAP. XI.

Of Plaisters.

1. The Greeks made their plaisters of divers simples, and put metals into most of them, if not all; for having reduced their metals into powder, they mixed them with that fatty substance whereof the rest of the plaister consisted whilst it was yet hot, continually stirring it up and down lest it should sink to the bottom; so they continually stirred it till it was stiff; then they made it up into rolls, which when they needed for use, they could melt it by the fire again.

2. The Arabians made up theirs with oil and fat, which needeth not so long boiling.

3. The Greeks' emplaisters consisted of these ingredients, metals, stones, divers sorts of earth, fœces, juices, liquors, seeds, roots, excrements of creatures, wax, rosin, and gums.

CHAP. XII.

Of Poultices.

Poultices are those kind of things which the Latins call *cataplasmata*, and our learned fellows, that if they can read English, that's all, call them cataplasms, because 'tis a crabbed word few understand; it is indeed a very fine kind of medicine to ripen sores.

2. They are made of herbs and roots fitted for the disease aforesaid, being chopped small and boiled in water to a jelly; then adding a little barley meal, or meal of lupins, and a little oil or rough sweet suet, which I hold to be better, spread upon a cloth and applied to the grieved place.

3. Their use is to ease pains, to break sores, to cool inflammations, to dissolve hardness, to ease the spleen, to concoct humours, and dissipate swellings.

4. I beseech you take this caution along with you: Use no poultices, if you can help it, that are of an

healing nature, before you have first cleansed the body, because they are subject to draw the humours to them from every part of the body.

CHAP. XIII.

Of Troches.

1. The Latins call them *placentula*, or little cakes, and the Greeks *prochikois*, *kukliscoi*, and *artiscoi*; they are usually little round flat cakes, or you may make them square if you will.

2. Their first invention was, that powders being so kept, might resist the intermission of air, and so endure pure longer.

3. Besides, they are easier carried in the pocketsof such as travel; as any man, for example, is forced to travel whose stomach is too cool, or at least not so hot as it should be, which is more proper, for the stomach is never cold till a man be dead: in such a case it is better to carry troches of wormwood or galangal, in a paper in his pocket, than to take a gallipot along with him.

4. They are made thus: At night when you go to bed, take two drachms of fine gum tragacanth; put it into a gallipot, and put half a quarter of a pint of any distilled water fitting for the purpose you would make your troches for to cover it, and the next morning you shall find it such a jelly as the physicians call mucilage: with this you may, (with a little pains taken) make a powder into a paste, and that paste into cakes called troches.

5. Having made them, dry them in the shade, and keep them in the pot for your use.

CHAP. XIV.

Of Pills.

1. They are called *pilulæ*, because they resemble little balls; the Greeks call them *catapolia*.

2. It is the opinion of modern physicians, that this way of making medicines was invented only to deceive the palate, that so by swallowing them whole, the bitterness of the medicine might not be perceived, or at least it might not be insufferable; and indeed most of their pills, though not all, are very bitter.

3. I am of clean contrary opinion to this. I rather think they were done up in this hard form that so they might be the longer digesting; and my opinion is grounded upon reason too, not upon fancy or hearsay. The first invention of pills was to purge the head; now, as I told you before, such infirmities as lie near the passages were best removed by decoctions, because they pass to the grieved parts soonest; so here, if the infirmity lies in the head or any other remote part, the best way is to use pills, because they are longer in digestion, and therefore better able to call the offending humours to them.

4. If I should tell you here a long tale of medicines working by sympathy and antipathy, you would not understand a word of it; they that are set to make physicians may find it in the treatise. All modern physicians know not what belongs to a sympathetical cure, no more than a cuckow what belongs to flats and sharps in music, but follow the vulgar road, and call it a hidden quality, because it is hidden from the eyes of dunces, and indeed none but astrologers can give a reason for it; and physic without reason is like a pudding without fat.

5. The way to make pills is very easy, for with the help of a pestal and mortar, and a little diligence, you may make any powder into pills, either with syrup or the jelly I told you before.

CHAP. XV.

The way of mixing Medicines according to the cause of the Disease, and part of the body afflicted.

This being indeed the key of the work, I shall be

somewhat the more diligent in it. I shall deliver myself thus;

1. To the vulgar.

2. To such as study astrology; or such as study physic astrologically.

1st. To the vulgar. Kind souls, I am sorry it hath been your hard mishap to have been so long trained in such Egyptian darkness, even darkness which to your sorrow may be felt. The vulgar road of physic is not my practice, and I am therefore the more unfit to give you advice. I have now published a little book, (Galen's Art of Physic) which will fully instruct you, not only in the knowledge of your own bodies, but also in fit medicines to remedy each part of it when afflicted; in the mean season take these few rules to stay your stomachs.

1. With the disease regard the cause, and the part of the body afflicted; for example, suppose a woman to be subject to miscarry through wind, thus do:

(1.) Look abortion in the table of diseases, and you shall be directed by that how many herbs prevent miscarrage.

(2.) Look wind in the same table and you shall see how many of these herbs expel wind.

These are the herbs medicinal for your grief.

2. In all diseases strengthen the part of the body afflicted.

3. In mixed diseases there lies some difficulty, for sometimes two parts of the body are afflicted with contrary humours, as sometimes the liver is afflicted with choler and water, as when a man hath had the dropsy and yellow jaundice; and this is usually mortal.

In the former, suppose the brain to be too cold and moist, and the liver to be hot and dry; thus do:

1. Keep your head outwardly warm.

2. Accustom yourself to the smell of hot herbs.

3. Take a pill that heats the head at night going to bed.

4. In the morning take a decoction that cools the liver, or that quickly passeth the stomach, and is at the liver immediately.

You must not think, courteous people, that I can spend time to give you examples of all diseases. These are enough to let you see so much light as you without art are able to receive. If I should set you to look at the sun, I should dazzle your eyes and make you blind.

2dly. To such as study astrology, (who are the only men I know that are fit to study physic, physic, without astrology, being like a lamp without oil) you are the men I exceedingly respect, and such documents as my brain can give you at present, being absent from my study, I shall give you.

1. Fortify the body with herbs of the nature of the Lord of the Ascendant, 'tis no matter whether he be a Fortune or Infortune in this case.

2. Let your medicine be something anti-pathetical to the Lord of the Sixth.

3. Let your medicine be something of the nature of his sign ascending.

4. If the Lord of the Tenth be strong, make use of his medicines.

5. If this cannot well be, make use of the medicines of the Light of Time.

6. Be sure always to fortify the grieved part of the body by sympathetical remedies.

7. Regard the heart, keep that upon the wheels, because the sun is the foundation of life, and therefore those universal remedies *Aarum Potabile*, and the Philosopher's stone cure all diseases by fortifying the heart.

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